

Diagnostic Engineering Publications

1410/7010

IBM POUGHKEEPSIE

April 15, 1964

APR 15 1964

001

Subject: Diagnostic Program DA01D, DA03D, DA04E, DA05C

Sequence Number 313, 301, 309, 305
Replaces DA01C, DA03C, DA04D

- I The following programs have been updated effective April 15, 1964
- | Old Level | New Level |
|-----------|-----------|
| DA01C | DA01D |
| DA03C | DA03D |
| DA04D | DA04E |
- II The DA05C Program is unchanged with this Update
- III The problems of selecting the Diagnostic or CE cylinders in the cylinder mode have been corrected in DA01D.
- IV A possible erroneous Nbt Ready Indication on the 1st pass through Rout 19 has been corrected in DA03D.
- V The portions of DA04D that overlayed at location 2000 have been corrected in DA04E. In addition a more extensive test of the I/O No-Op has been added in Routines 1 and 2.
- IV In the DA01 write-up, the Flag-a-Track procedure has been rewritten to clarify and alleviate the confusion created by the original write-up.

Enclosures: 300 Pages

Card Deck for CARD ONLY SYSTEMS (as punched by UP51)

Cards - Card Loader and Core Clear

Cards No. Data Cards

Card Execute Card

Distribution: 1410

7010

Other 1410/7010 Installations with 1301-7631

APR 15 1964

VI Description of Card Decks (Punched from Memory Dump Tape using UP51)

DA01D	L1A Card Loader	7	Cards 1-7
	Core Clear Card	1	Card N/A
	System & Channel Cards	5	Cards 001-005
	Data Cards	130	Cards 006-135
	Execute Card	1	Card N/Aa
	Program Total		
DA03D	L1A Card Loader	7	Cards 1-7
	Core Clear Card	1	Card N/A
	System & Channel Cards	5	Cards 001-005
	Data Cards	168	Cards 006-173
	Execute Card	1	Card N/A
	Program Total		
DA04E	L1A Card Loader	7	Cards 1-7
	Core Clear Card	1	Card N/A
	System & Channel Cards	5	Cards 001-005
	Data Cards	171	Cards 006-176
	Execute Card	1	Card N/A
	Program Total		
DA05C	L1A Card Loader	7	Cards 1-7
	Core Clear Card	1	Card N/A
	System & Channel Cards	5	Cards 001-005
	Data Cards	113	Cards 006-118
	Execute Card	1	Card N/A
	Program Total	127	Cards

APR 15 1964

4/15/64

7631 - 1301

**ADVANCED DISK FILE DIAGNOSTIC
PROGRAM PACKAGE**

To be used with 1410/7010 Systems

April 15, 1964

* DA01D	Home Address & Surface Test
* DA03D	1301 - 7631 Reliability
* DA04E	Electronic Operation
DA05C	Mechanical

* Note: These programs have been altered with this
Up Date
These Programs use Channel and System Control
Cards. Please Read the Write Up Carefully.

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7631-1301

PACKAGE WRITE-UP

6.01.00.0 DESCRIPTION

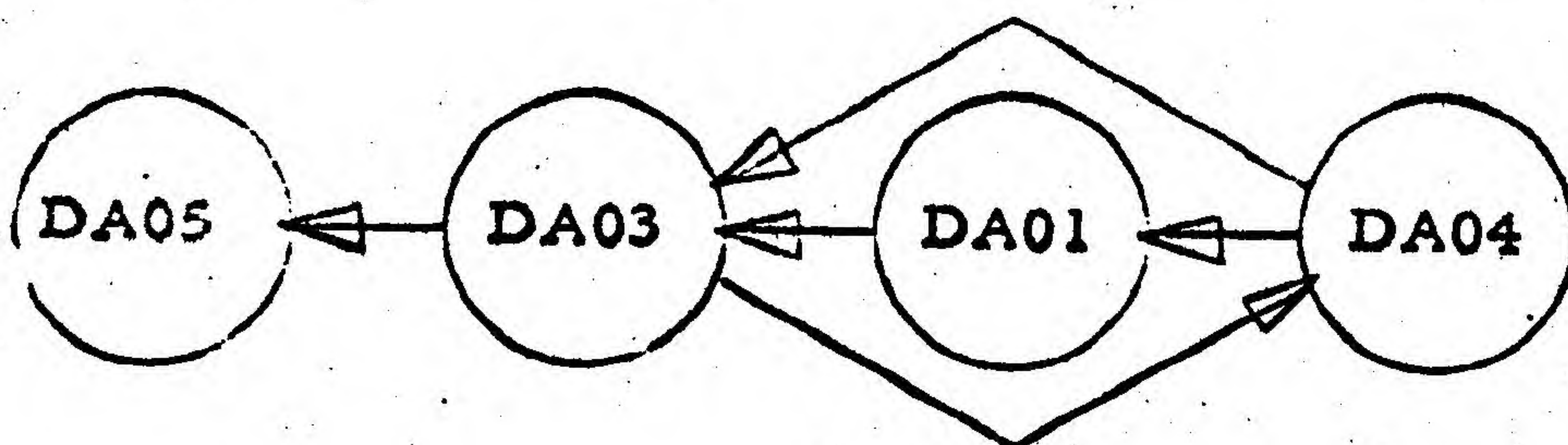
This package obsoletes the previous set of diagnostic programs used on the 7631-1301. The package makes use of control functions which are standard for all the programs in the set, making operation and utilization of the programs much easier.

The programs in this package are designed to test the 7631-1301 when attached to a 1410 or 7010 system. Each program tests a specific area and together the programs make up a diagnostic package.

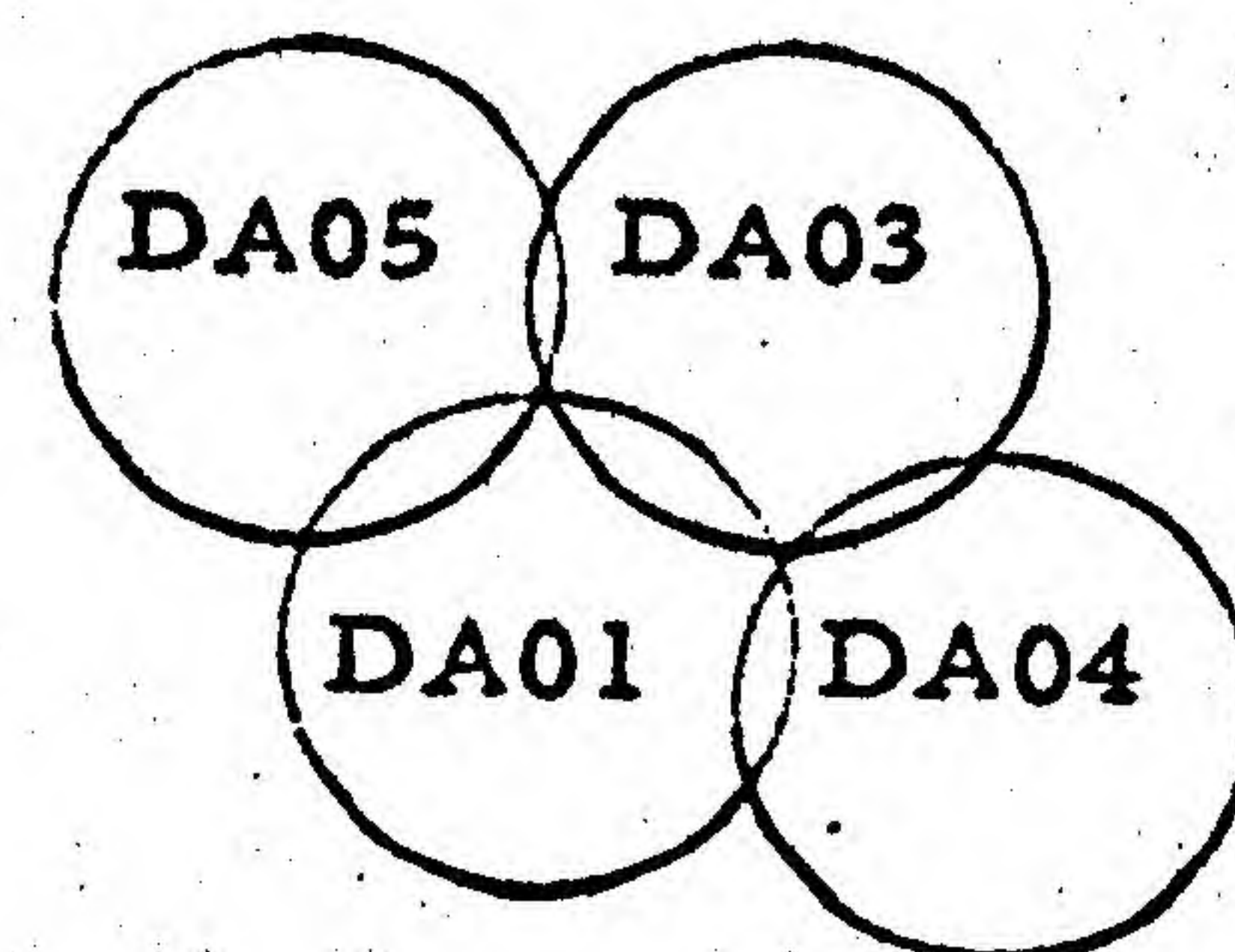
Program Functions

<u>New</u>	<u>Function</u>	<u>Old</u>
DA01D	Write HAI's	DA01C
	Analyze Surfaces	
DA03D	Reliability Test of 7631-1301	DA03C
DA04E	Electronic Operation Test (7631)	DA04D
DA05C	Mechanical Test (1301)	DA05B

It is important to realize that these programs do overlap in scope, and this overlapping should be used to aid in determining which program to run next. Figure 1 will help in showing how the programs are to a degree inter-dependent and overlapping.



Inter-Dependent



Overlapping

6.01.00.0 DESCRIPTION (continued)

Being inter-dependent means certain programs assume correct operation of an area that is tested by another program. In this case DA04 is the only independent program, all others are dependent. This all points out the fact that the programs constitute one overall test of the 1301-7631 and understanding the general test philosophy will aid in learning the individual programs.

The package can be divided into four areas - utility, mechanical-physical, reliability, and electronic.

Utility is covered by the portion of DA01 which prepares the 1301 for usage by writing the home addresses and insuring they are correct. This is generally only run upon installation and may never be used again unless the home addresses are destroyed.

Mechanical-Physical - This area takes into account the condition of the 1301 access mechanism and the physical condition of the disk surfaces on the 1301. DA05 performs the necessary tests on the access mechanism while DA01 analyzes the disk surface.

Reliability - This makes a general test of the 7631-1301 as an operating device attached to the 1410-7010. DA03 is a test which should tell of trouble areas, including areas of priority and overlap.

Electronic - This area is covered by DA04 which makes a stringent test of the logic in the 7631-1301 and the lines from the 1410-7010 to the 7631. This program attempts to isolate troubles to the smallest possible area, starting with the simplest operation it builds upon the tested logic in order to test other logic.

Within each program is a set of small routines, each routine is to a large degree independent of the other routines in the program, but together the routines test one of the four areas previously described. By using this technique of breaking each program into small parts, the purpose and methods of a test should be easier understood.

6.01.00.0 DESCRIPTION (continued)

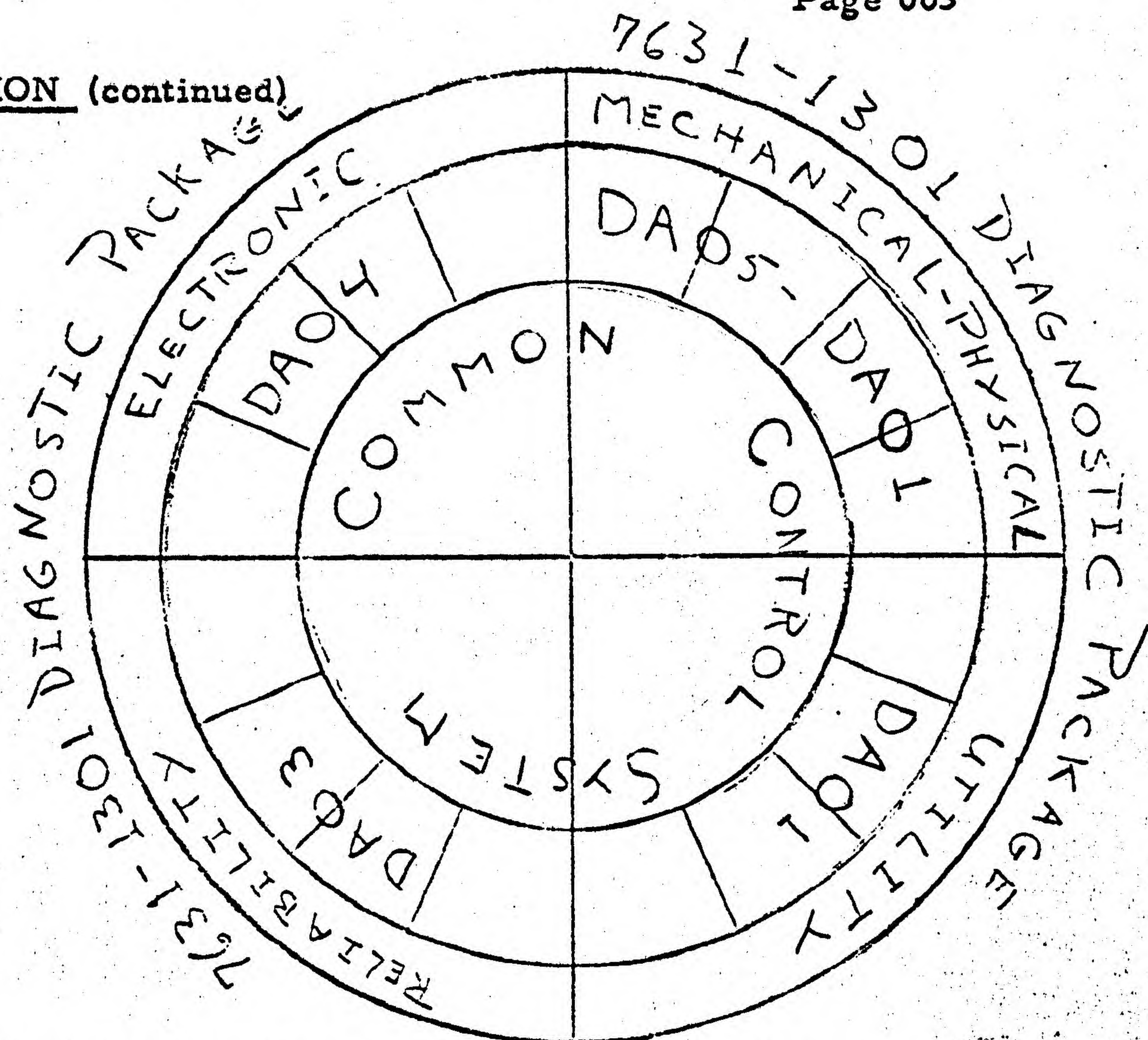


Figure 2 shows the overall package broken into the four areas of coverage, each area being tested by certain programs and each program broken into routines which test a part of the area. If memory space were available, the entire package could be written as one program, which would certainly simplify the operating procedures. Because this is impossible, a standard operating control system has been designed which is used by all the programs. This system encompasses the following areas, and the remainder of this write-up is devoted to it.

1. Loading Procedure
2. System and Channel Control Cards
3. Standard Pre-Set TAD's (1000-1003)
4. Standard Error Typeout Format
5. Standard Program Options
6. Standard Channel Alter Routine
7. Standard Looping Methods
8. Standard Type Routine
9. Standard Restart Procedures

The standard procedures outlined here will not be repeated in the individual program write-ups since these apply for every program.

6.01.02.0 OPERATING PROCEDURES

The following operating procedures apply to all programs in this package.

02.1 SYSTEM AND CHANNEL CARDS

All the "DA" series programs use system and channel control cards to provide information about—

- a. Overlap
- b. Priority
- c. Machine Type
- d. Channels Available
- e. Files Available
- f. Tapes Available

These cards must be pulled from the card decks and the proper data entered according to the procedure outlined in the 1410/7010 Introductory Material. The system and channel cards in each of these programs are numbered card 9, 10, 11, 12 and 13. Cards 12 and 13 apply only to a 7010 and may be discarded on a 1410.

02.2 STANDARD TADS (1000-1003)

The standard TAD's 1000-1003 are used by all the "DA" series programs. The TAD's are pre-set to "1" when the programs are initially loaded and are changed to a "1" setting only by manual intervention. Definition of standard TAD's is as follows:

	<u>Not 1</u>	<u>1</u>
01000 TAD 0	Allow error typeouts	Bypass error typeouts
01001 TAD 1	Do not Req loop after error	Req loop after error
01002 TAD 2	No error halts	No error halts
01003 TAD 3	Single program pass	Repeat program

Note: In the "DA" series programs TAD 1 = 1 does not mean unconditional looping; rather it means that after an error has occurred, the program will request if the CE wants to take action. At this point the CE may take any of the standard program options available. (These options are described later in the write-up.)

Also, TAD 2 = 1 has no meaning as there are no error halts in the "DA" series programs.

Methods for altering the TAD's are discussed later in this write-up under program options.

6.01.02.0 OPERATING PROCEDURES (continued)

02.3 SPECIAL TAD's (1004-1012)

Every effort has been made to keep the special TAD's required to a minimum. When special TAD's are required, they will be pre-set to a 1 condition and may be altered by the CE when so desired. Refer to the individual programs for the definition of the special TAD's that it uses.

02.4 PROGRAM CONTROL OPTIONS

Each of the "DA" programs has a standard set of control options which are available to the CE through the I/O console printer. Using the Inquiry Request key the CE may interrupt the program and take any of the control options he desires. The following procedure is used to accomplish this.

- a. Press Inquiry Request key
- b. When the keyboard unlocks, enter
 - 1) Control option code desired
 - 2) Data required by the program to honor the request
- c. Press Inquiry Release key.

Providing a legal option has been requested, the program will immediately honor the request. If the option is illegal (it does not exist), the program returns to the read console operation, a legal option must be requested.

Table 1 shows the options available, and the code and data required to request the option. See control option definitions for details of each option.

Option	Code	Data Required-Enter
End of Test.	Blank	None
Alter TAD's (1000-1003)	1	Four new TAD settings desired (all 4 TAD's altered)
Alter Memory	2	Five-digit memory address to be altered
Alter Sequence of Routines	3	01, 03, 04, L Enter routine numbers separated by comma, last character is L or E
Loop a Routine	4	Five-digit starting address of routine to be looped
Loop an Instruction	5	Enter M or L, Ch code Char, Specific File Op, W or R, BOSIO Op Code, HAL, No. of Rec's, No. of Char's/Rec, Data Char, Rec Addr.
Restart	6	Five-Digit Memory Address to start at
Continue	7	None

TABLE 1

6.01.02.0 OPERATING PROCEDURES (continued)

Definition of Control Options

1. End Test - This option will terminate the test immediately unless TAD 3 = 1, in which case the program would restart from the beginning.
2. Alter TAD's - This option will alter the standard TAD's to those entered after the option code. This option will not alter any special TAD's.
3. Alter Memory - On this option the address to be altered is entered after the option code. After pressing release, the Inquiry Request is pressed again and the alteration is made. Special TAD's may be altered in this manner.
4. Alter Sequence of Routines - This option allows the CE to alter the sequence of the routines in a program. Each routine is numbered in the sequence in which they normally run, i. e., 01, 02, 03, etc., by selecting this option and entering 03, 01, 02, L, the program will run the routines in the requested sequence. A comma is entered between each routine number and the last character entered is an L or E.

L The program loops on routine sequence entered.

E The program returns to the program control option routine after one pass. CE now selects a new control option, i. e., continue.

Any group of routines or all of the routines may be selected in the sequence desired.

WARNING - Before using this option, one should be very familiar with the functions of the individual routines being selected.

5. Loop a Routine - This option causes the program to loop on the routine whose starting address was entered with the option code. When looping a routine, all error typeouts are bypassed and the loop is ended only by pressing Inquiry Request and selecting another option (probably the continue option).

6.01.02.0 OPERATING PROCEDURES (continued)

6. Loop an Instruction - Through this option the CE may cause the program to loop on anyone of five file operations with data fields of a format requested. The file operations which may be selected are:

Single Record Op
Track Record Op
Home Address Op
Track Record with Addresses
Write Format Op

Besides the control option code, the CE must enter the data required to build the one instruction loop and data field desired. This data must be entered in the following manner after the control option code.

- a. M for 6 bit mode
L for 8 bit mode
- b. % - Ch 1
 ⌘ - Ch 2 Unoverlap
 ? - Ch 3
 ! - Ch 4
 @ - Ch 1
 * - Ch 2 Overlap
 \$ - Ch 3
 # - Ch 4
- c. 1 for SRO
2 for TRO
5 for HAO
6 for TWA
7 for WFO
- d. W for Write
R for Read
- e. R Ch 1
X Ch 2
3 Ch 3
1 Ch 4
- f. 9#0088 - 9#5988 File Home Address (CE tracks only)
- g. 000 - 999 Number of Records desired
- h. 0000 - 2840 Number of Characters/Record

6.01.02.0 OPERATING PROCEDURES (continued)

6. i. X Any data character desired to be used in the records
- j. XXXXXX Any six-digit record addr desired. This addr will be incremented by 1 for each record.

NOTE: When using this option the CE should be aware of the limitations on the number of records versus the number of characters. Knowledge of the existing format track or rewriting the format track (use this option) is necessary to insure valid operation. Once the program enters this loop, the Inquiry Request must be used to exit from the loop. Then another option must be selected, most likely the continue option would be selected. No errors are indicated while in this loop.

7. Restart at Desired Memory Location - This allows the CE to begin at any point in the program by entering the memory location at which the restart is desired. To restart a program from the beginning, always enter 02000.
8. Continue from Point Where Program was Interrupted - This allows the CE to cause the program to continue in a normal fashion after interrupting it for looping purposes or accidentally pressing the Inquiry Request.

The program control options described here are available at any time and should be used as much as possible for aids in troubleshooting.

The control option "Alter Sequence of Routines" will not be available in programs which do not lend themselves to this option. Refer to individual program write-ups for this information.

In addition to the standard options, a program may have a special purpose option available; again refer to the individual program write-ups for this information.

When TAD 1 = 1 (request action after error), the CE may take any of the control options available by using the procedures outlined here after an error has occurred.

6.01.03.0 OPERATING HINTS

Read and understand the package write-up and program write-ups.

- 03.1 The alter memory option and loop a routine option could be used to alter a routine for some condition and then loop on the routine altered for troubleshooting the bug.
- 03.2 Several options may be selected sequentially by pressing Inquiry Request immediately after pressing Release for a selected option.
- 03.3 To restart a program from the beginning, use option 6 and a starting address of 02000.
- 03.4 The programs in this package require switch settings before the program is run. Be certain these switches are set. Refer to the program write-ups for details.
- 03.5 Any routine may be bypassed by altering the first instruction of the routine to an unconditional branch to the exit (or last instruction) of the routine.

6.01.04.0 PROGRAM STOPS AND RESTARTS

The following stops and restart procedures apply to all programs in this package.

04.1 ERROR HALTS

There are no program halts due to error results; TAD 2 = 1 has no meaning in this package of programs.

04.2 NORMAL HALTS

The programs may have normal halts to allow for switch settings; if so, they will be defined in the individual program write-ups.

04.3 AUTOMATIC RESTART PROCEDURE

By setting the check control switch on the console-CE-Test-Panel to Reset and Restart, the programs will automatically restart after a 1410/7010 alarm condition. This can be used to great advantage when looping a routine or instruction which is causing an alarm condition. Furthermore, this technique can be used to insure that once a program is started, it may be left unattended without fear of stopping because of alarms.

04.4 MANUAL RESTART PROCEDURE

If the check control switch is not used and an alarm condition is encountered, the program can be made to continue by pressing Computer Reset and Start.

6.01.04.0 LOADING PROCEDURES

04.1 FROM CARDS (Load Program L1A preceding Card Deck)

A. 7010-1410 without Load Button.

1. Display Memory Location 00000

2. Alter to

VV
RL%1100011\$.

V
X ☒
3 ?
V !

Enter according to channel location
of the card reader.

3. Set to Run, Computer Reset and Start.

B. 7010 with Load Button

1. Computer Reset

2. Depress Load Button

04.2 FROM TAPE (80 Character Master or Memory Dump Tape)

A. 7010-1410 without Load Button

1. Display Memory Location 00000

2. Alter to

VV
RL%B000011\$.

V
X ☒
3 ?
V !

Enter according to channel location
of the tape drive.

3. Set to Run, press Computer Reset.

B. 7010 with Load Button

1. Computer Reset

2. Depress Load Button

6.01.05.0 TYPEOUTS

The standard typeouts for all the "DA" series programs are as follows:

05.1 TITLE

The first typeout will be the five-digit program identification.

Example: DA01C

05.2 ERROR TYPEOUTS STANDARD FORMAT

- a. All errors will be preceded by "ROUTINE N00." This identifies the failing routine.
- b. All status errors, errors indicating status condition on the I/O device, will appear in this format:

```
*Error      00000      M%F099999W      1248AB
```

```
1)          2)          3)          4)
```

- 1) Error Flag
- 2) Starting address of failing routine
- 3) Failing instruction
- 4) Status indicator that was on

1	Not ready
2	Busy
4	Data Check
8	Ext. Cond.
A	No transfer
B	Wrong length record

- c. All program detected errors, errors for which the computer does not give an indication of error, will appear in the following format. Refer to program listing for explanation of error.

```
*Error      01 02      00000
```

```
1)          2)          3)
```

- 1) Error Flag
- 2) Error(s) detected during routine
- 3) Starting address of failing routine

6. 01. 05. 0 TYPEOUTS (continued)

- d. Combinations of status errors and program detected errors will appear in this format:

*Error 01 00000 M%F099999W 1248AB

- e. Any data which may be pertinent to the error, i. e., file address, may appear as the third line of the error message. This is not standard and will be given only as required. (See individual program write-ups.)

- f. If TAD 1 = 1 (request loop after error), the following will appear; it will be the last line of the error message.

REQ ERROR ACTION

- g. The maximum error message would look like this:

ROUTINE N00

*Error 01 00000 M%F099999W 1248AB

PERTINENT DATA

REQ ERROR ACTION

05.3 SUMMARY TYPEOUTS

Programs which may be run in a reliability mode for long periods of time will give a summary of errors. This summary will be given when:

- a. A specific error has occurred ten times
- b. The test is terminated.
- a. In the case where a specific error has occurred ten times, the following is typed:

"ERR00 COUNT 10"

The program continues automatically after this typeout.

6.01.05.0 TYPEOUTS (continued)

- b. When the program is terminated (manually or by the program itself), a complete summary of errors is typed.

"ERROR COUNT"

"00 6"

"01 4"

"07 3"

etc.

"NR BY DC EC NT WLR"

" 0 3 1 6 0 12 "

The first table indicates the number of times a program detected error occurred. This total should be added to the "10 COUNT" typeouts for any specific error.

The second table is the number of times any of the status indicators were found to be on.

NOTE: The summary is given whether or not TAD 0 is set to 1. This allows normal error typeouts to be bypassed without a loss of information. Refer to the individual programs for information on the availability of the summary typeout.

05.4 END OF TEST MESSAGE

When the program is complete or has been terminated, the word "PASS" is typed out before transferring to the load program.

NOTE: All messages are given on the typewriter.

6.01.06.0 FLOW CHARTS

The following pages contain flow charts of the control routines which are common to all the programs in this package. With each flow chart is a short description of the routine. By understanding these routines, a basic knowledge of the control for all the programs is gained.

06.1 MONITOR ROUTINE

This routine is used by all programs and is entered after each test routine is completed. It serves the following functions:

- A. Checks for manual intervention requests.
- B. Checks for looping of a routine and returns to start of routine being looped.
- C. Allows the error routine to check for errors that may have occurred.
- D. Checks if the "alter sequence of routines" option has been selected. If it has, monitor gives control to the sequence control routine.
- E. Determines if test routine was completed or if test routine encountered an error which it requested be indicated immediately. After making this decision, it returns to the next instruction in the routine or goes to the start of the next routine.

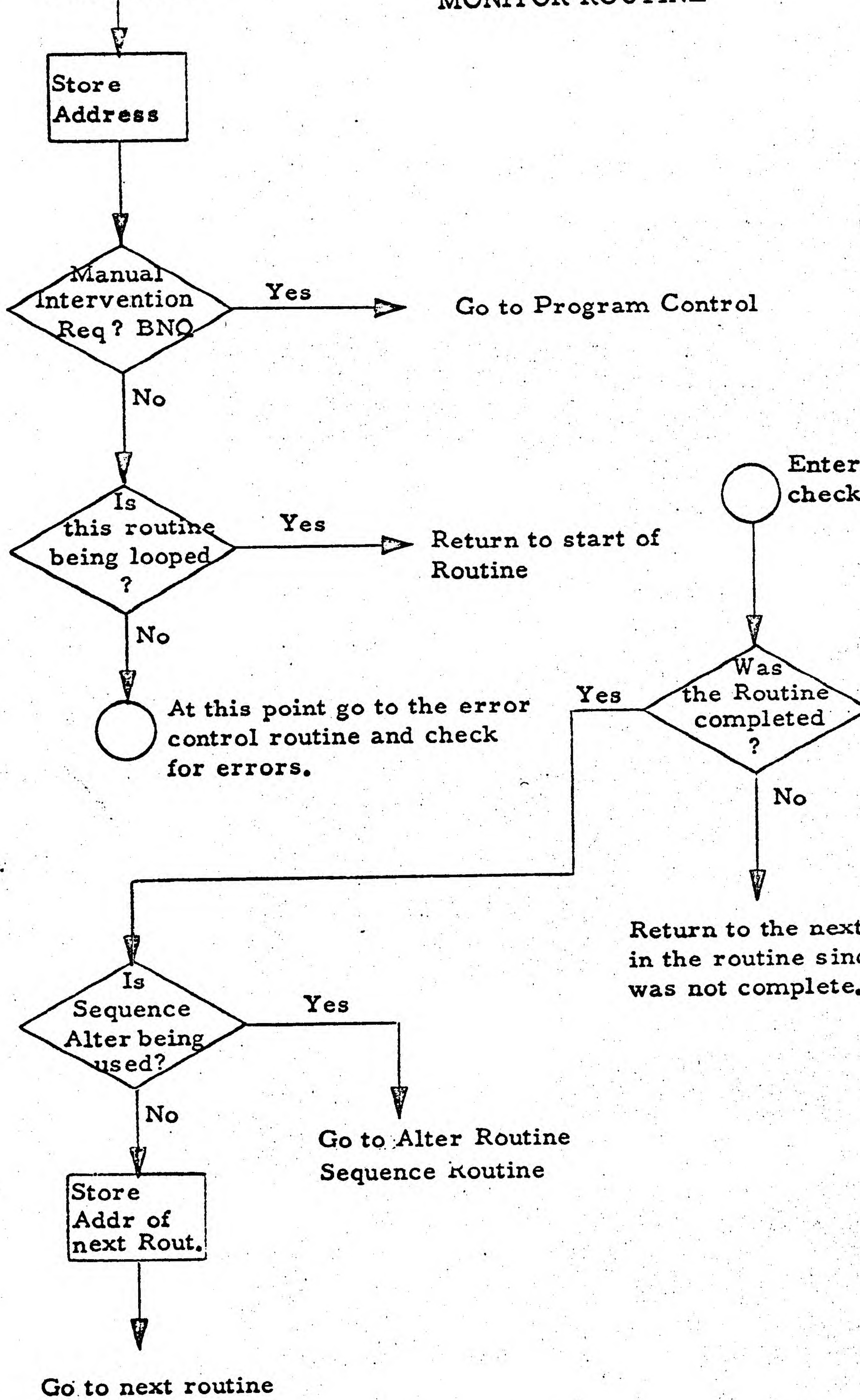
025

DA01, DA03,
DA04, DA05

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MONITOR ROUTINE

Enter here from
Test Routine



06.2 CHANNEL ALTER ROUTINE

The channel alter is used by all the diagnostic programs in this package to initialize themselves for operation on channel 1, 2, 3 or 4.

The routine which needs to be initialized branches to the channel alter routine; immediately following the branch are constants which define the Hi and Low limits of memory to be altered and the characters required to alter for a given channel. This data is used by the alter routine which scans from the Hi limit to the Low limit in memory altering the following instruction according to the channel desired.

1. The branch-on-status indicator-on instructions are changed to

R	Ch 1	3	Ch 3
X	Ch 2	1	Ch 4

2. The Hi order position of the X-Ctl field is changed to

%	Ch 1	@	Ch 1
□	Ch 2	*	Ch 2
?	Ch 3	\$	Ch 3
!	Ch 4	#	Ch 4

Unoverlap

Overlap

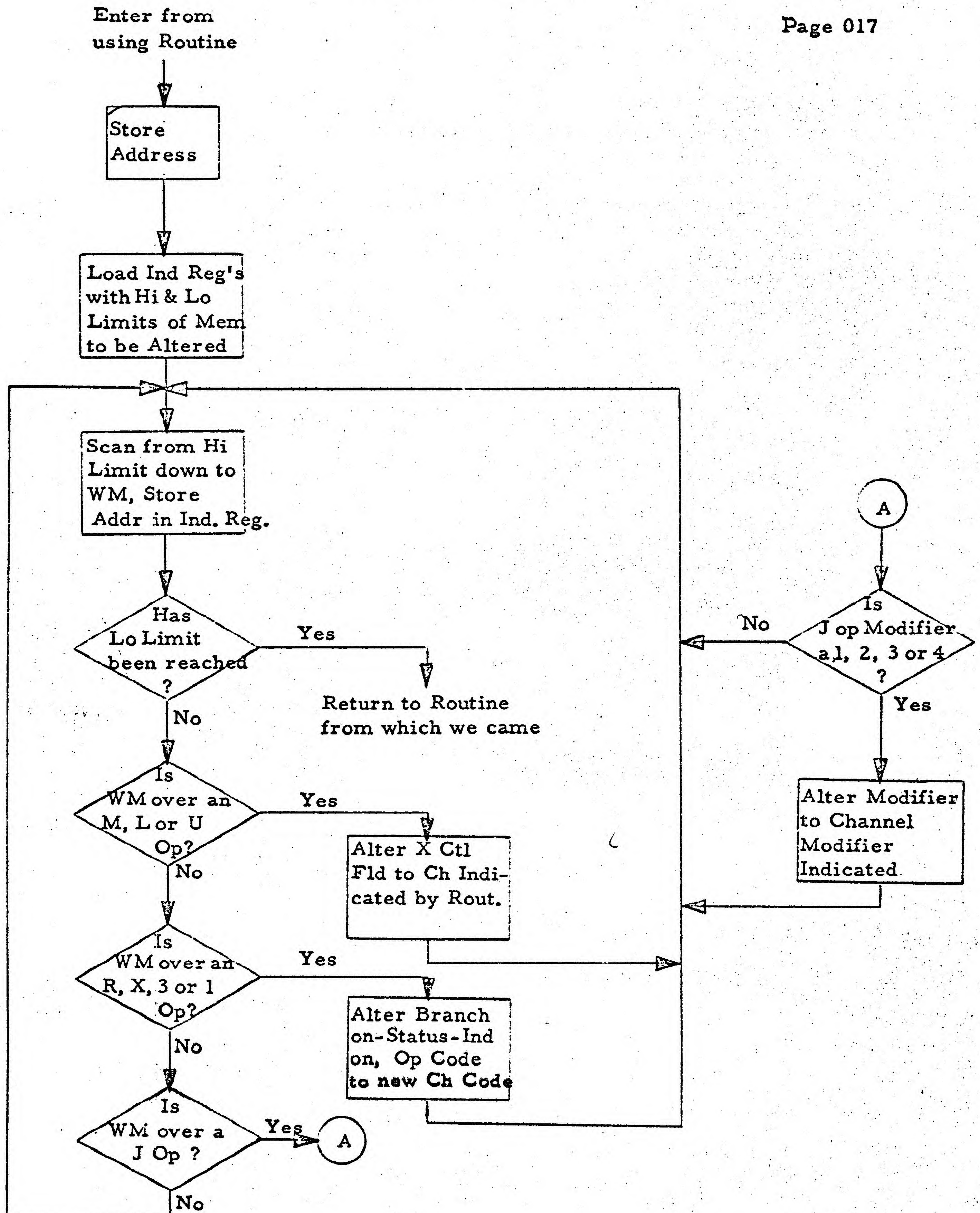
3. The branch on overlap in process modifier is changed to 1, 2, 3 or 4 according to the channel.

CHANNEL ALTER ROUTINE

DA01, DA03,
DA04, DA05

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027



029
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DA04, DA05

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06.3 STATUS CHECK ROUTINE

All programs use this routine to determine which of the six indicators is on. When a test routine encounters an unexpected status error, it branches to the status check routine. Here each indicator is checked for the on condition and a total is kept for each time a specific indicator comes on. Coded characters are placed in the print field for each indicator found on, and the status check routine finally branches to the error control routine where the error will be typed out.

STATUS CHECK ROUTINE

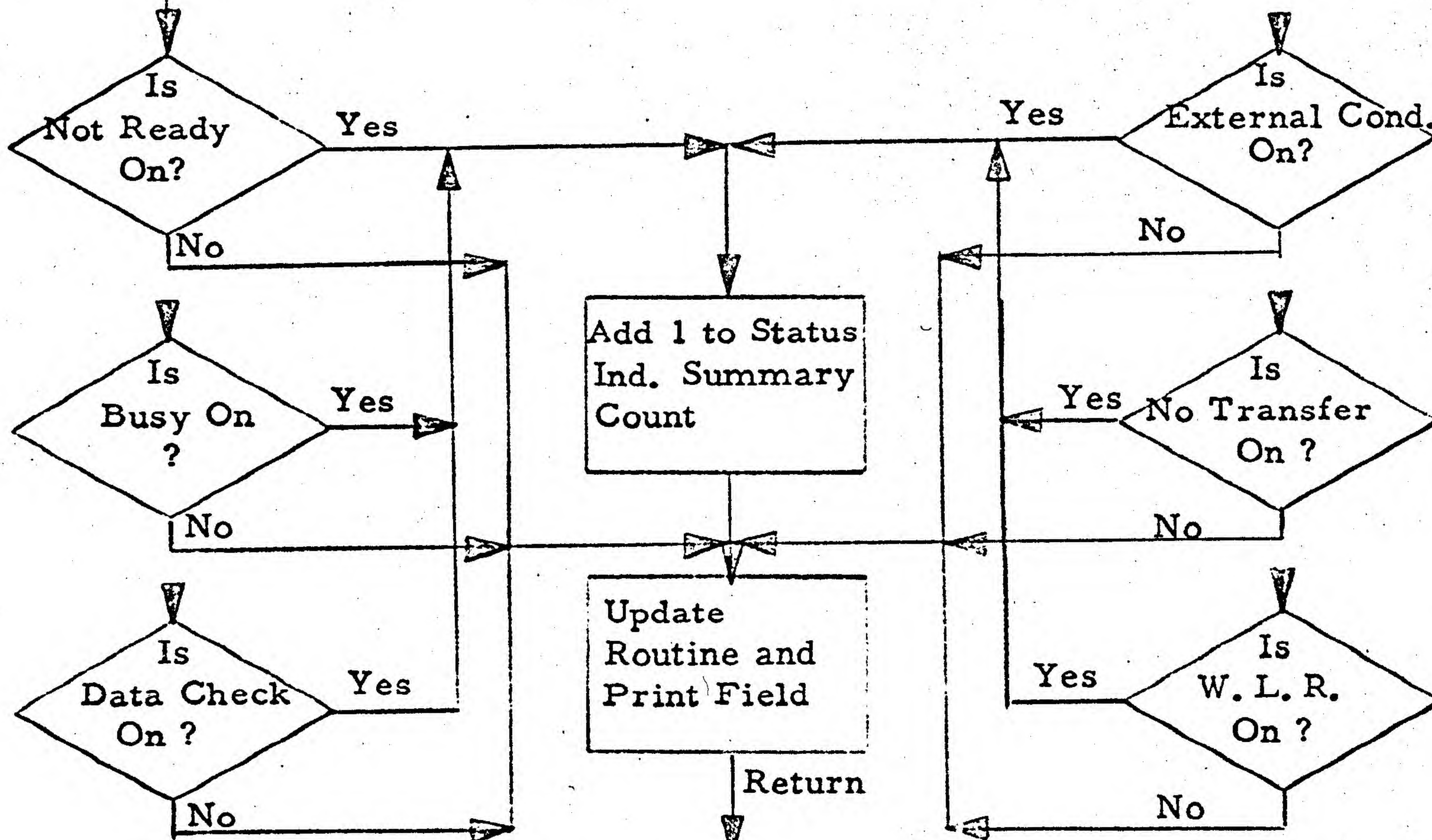
Enter here from
Test Routine

Store Address
Determine
which Channel
to Check

Load Ind Reg
and Move Codes
to Print Area
Prepare for Char.

Go to the channel alter routine and
alter this routine to the proper channel.

Return here after
Channel Alter.



Return to next
Branch-on-Status-
Ind-on Instruction

Go to error
control routine
and type out the
error.

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DA04, DA05

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06.4 ERROR CONTROL ROUTINE

This routine locates the file instruction in the test routine that may have caused the error, determines if any program detected errors occurred, prepares the print field, checks TAD 1000 and types the standard error message plus any extra data specified by the using program.

Error control is entered from the status check routine or from monitor. It exits to monitor or to the program control routine if TAD 1001 = 1.

ERROR CONTROL ROUTINE

Page 021

Enter from Monitor
or Status Check Routine

Locate File
Inst. that may
have failed

Locate Prog.
Detected errors
which may have
occurred, load
print field

If
there were
errors, does
TAD1000 = 1

No

Go to Monitor

Yes

Go to type routine
and typeout error

Return here after
type routine

Type any
Extra Data
Required

A

A

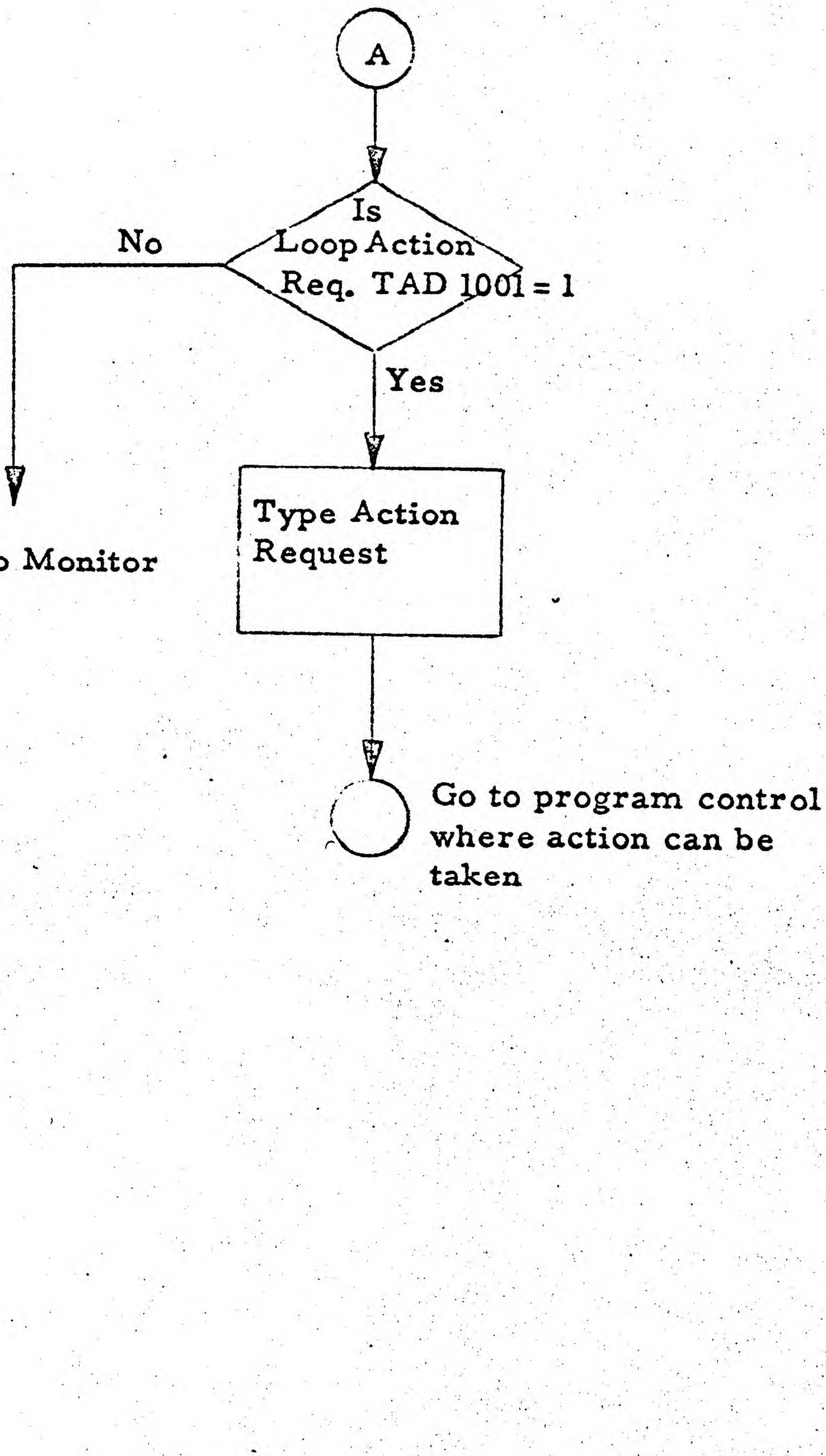
Is
Loop Action
Req. TAD 1001 = 1

No

Yes

Type Action
Request

Go to program control
where action can be
taken



032
DA01, DA03,
DA04, DA05

Page 022

06.5 PROGRAM CONTROL ROUTINE

- . This routine allows the operator to interrupt the program at any time and take any one of eight standard options which are available.

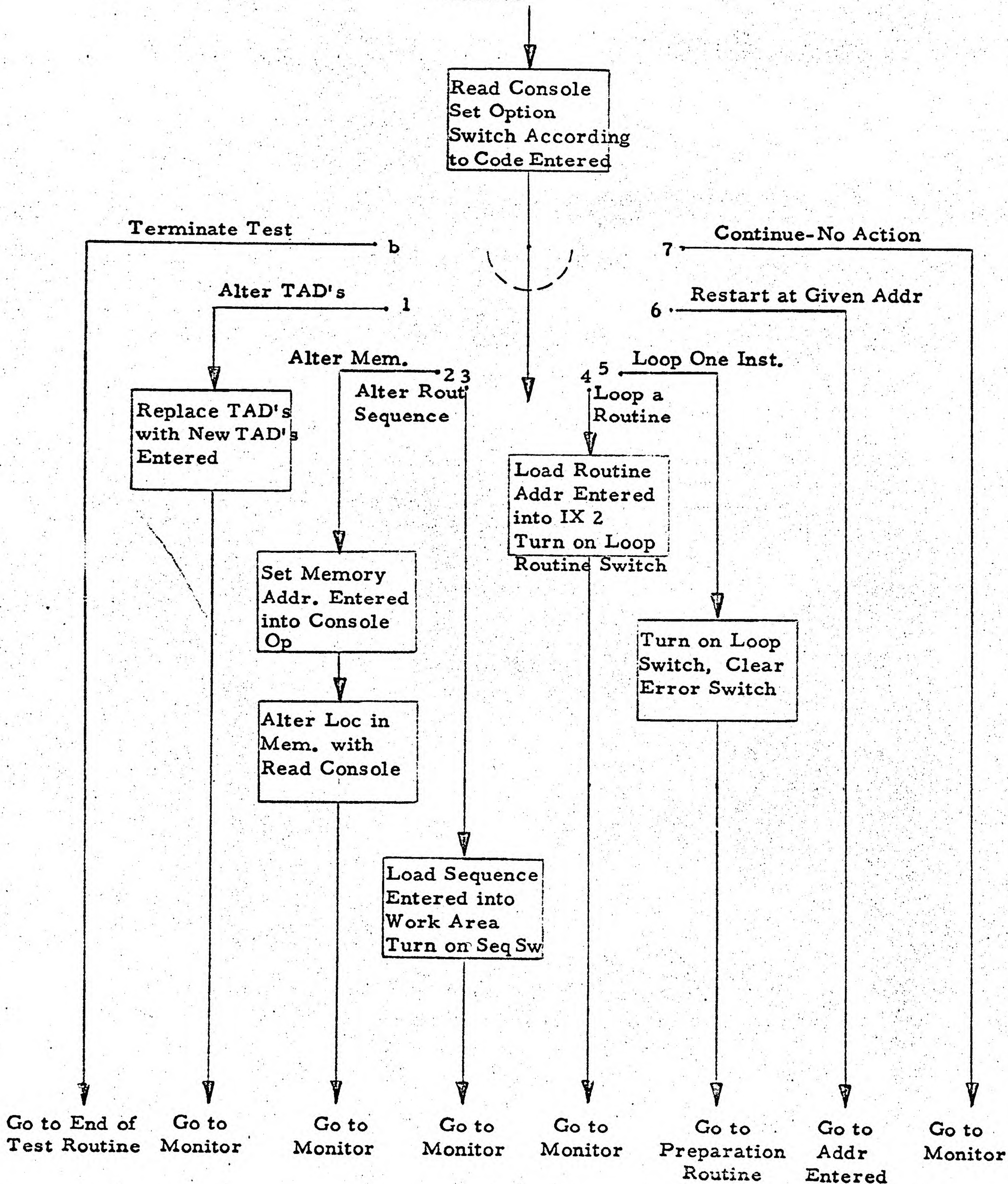
There are two ways to enter this routine, by pressing Inquiry Request or by setting TAD 1001 to a 1. By using inquiry the monitor will give control to program control, with TAD 1001=1 error control will branch to program control after requesting action. In either case, once program control is entered the operator may take any option available. In certain programs special options will be available, and in some cases a standard option may not be available.

PROGRAM CONTROL

DA01, DA03,
DA04, DA05

Page 023

Enter here from
Monitor or Error
Control



034
DA01, DA03,
DA04, DA05

Page 024

06.6 ALTER ROUTINE SEQUENCE

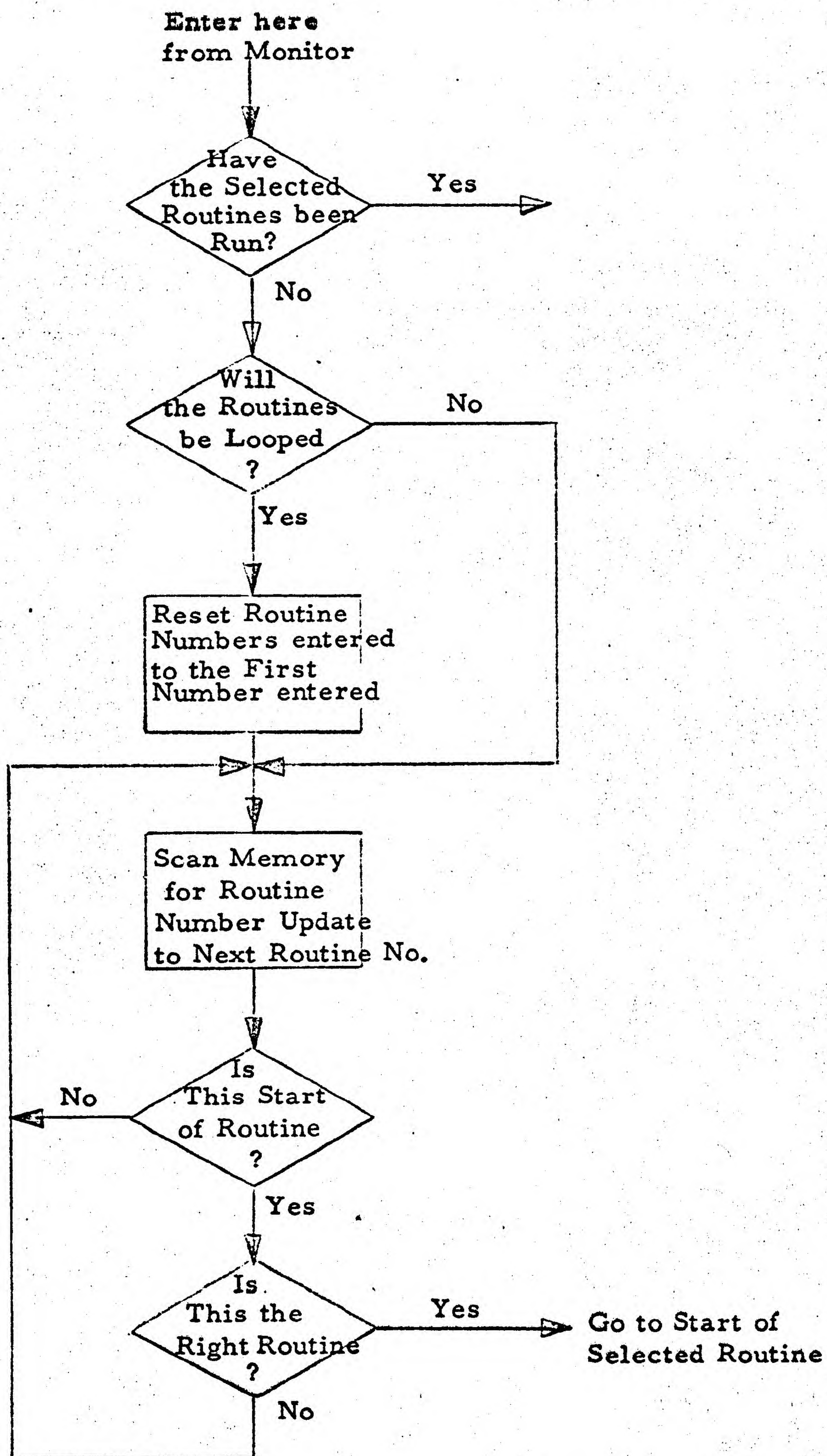
This routine is entered from the monitor routine only after the CE has selected the option through program control.

When the CE selects this option, he enters a list of routine numbers in the sequence he wants them run. Up to 25 routine numbers may be entered, and any routine number may be repeated.

Once the alter routine sequence option is selected, the routines listed by the CE are run one time or looped according to the last character entered by the CE. If it is "L" the routines are repeated, if it is "E" the routines are run only once.

When monitor recognizes that this option is selected, it does not go to the next sequential routine, but rather goes to the "alter routine sequence" routine. Here the routine numbers entered are searched for one at a time and the routines are executed in the sequence selected by the CE.

ALTER ROUTINE SEQUENCE



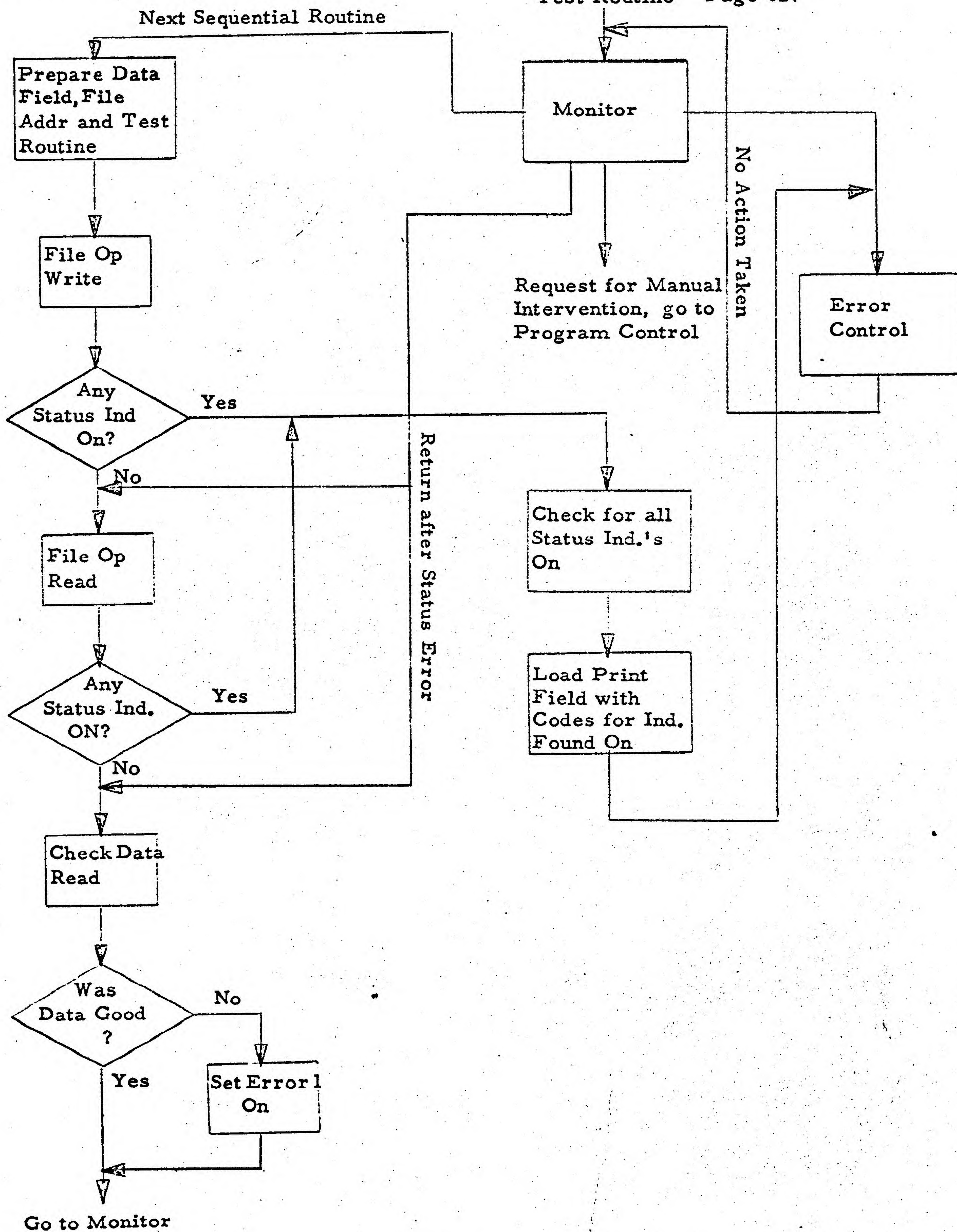
TEST ROUTINE USING CONTROL ROUTINES

This flow chart shows a typical test routine and how it is linked to the control routines. Note how the routine is entered from the monitor control routine and when it is completed returns to the monitor routine. It is also important to understand that when a status error occurs, the test routine exits directly to the status check control routine. After the status error has been indicated, the monitor control routine returns to the test routine one instruction after the point where the status error was detected. The program detected error, read data was no good, is stored until the test routine is complete and goes to monitor. Monitor allows the error control routine to check for these program detected errors, if any are found to be on an error message is given.

Example of Test Routine using
Control Routines

DA01, DA03,
DA04, DA05

Previous
Test Routine Page 027



GENERAL FLOW CHART OF STANDARD CONTROL ROUTINES AS USED WITH A PROGRAM

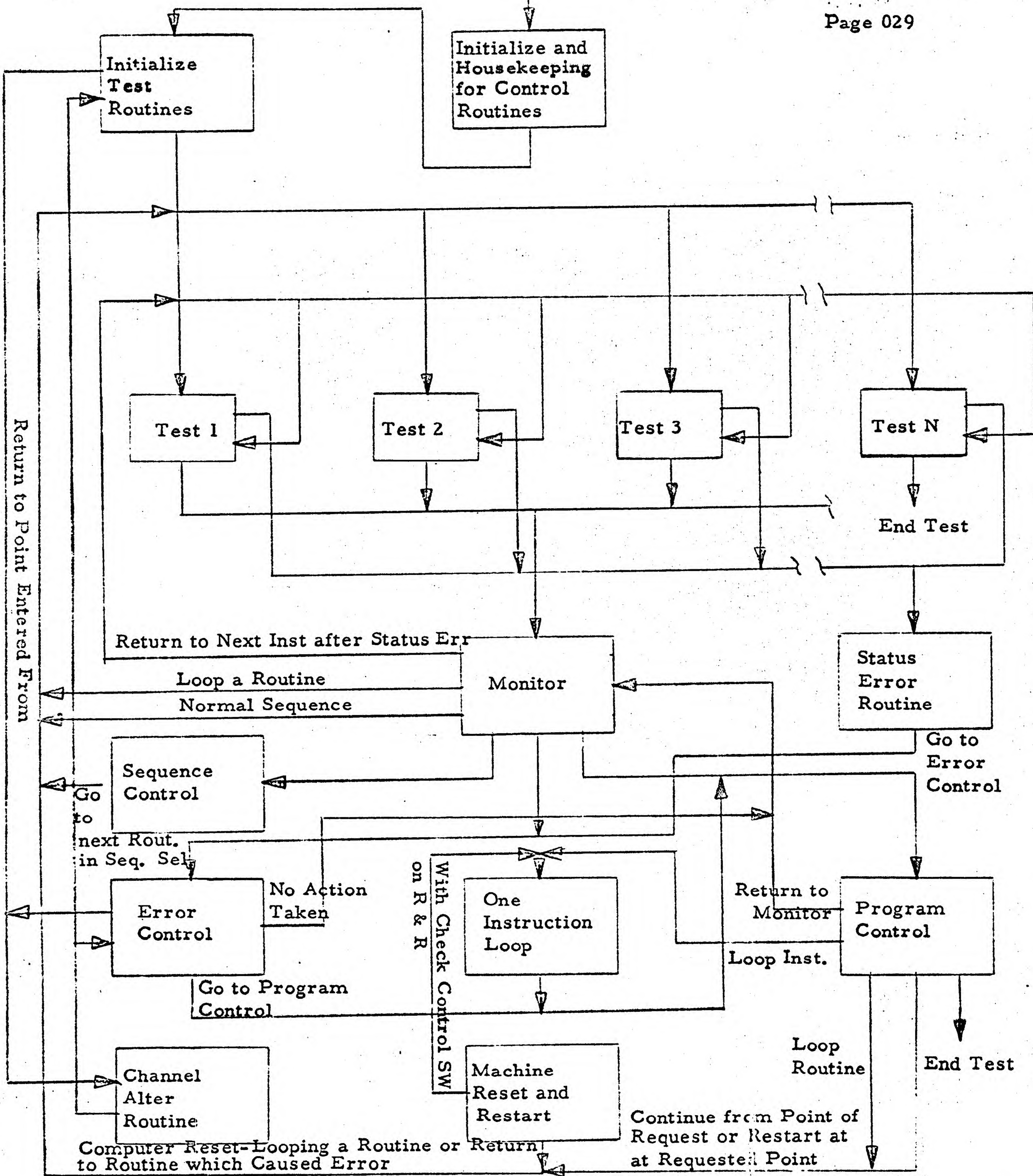
This flow chart shows the relationship of the standard control routines to the diagnostic test routines and to one another. Since these control routines apply to all the programs in the "DA" series, this flow chart can be used as a block diagram of all the "DA" programs. Note that each test sub-routine is entered from and exits to a standard control routine. This is true of all sub-routines used in the "DA" series.

Standard Control Routines
as Used with a Program

DA01, DA03,
DA04, DA05

Page 029

2000



APR 15 1964

6.02.00.0 DA01 HOME ADDRESS AND SURFACE TEST DESCRIPTION

This test performs the functions previously performed by DA01C, the program is made up of 5 tests which may be run in 1 of 4 modes, giving a total of 20 variations. The tests which may be run are:

- a. Write home addresses and verify addresses
- b. Verify addresses
- c. Analyze surfaces
- d. Write addr, verify addresses, and analyze surfaces
- e. Analyze surfaces and verify addresses

The modes in which these tests may be run are:

- a. Entire module
- b. One cylinder
- c. One surface
- d. One track

There is actually one other selection which may be made, this is for flagging a defective track. The flagging routine is available as a program option and would usually be selected only when the surface analysis test has determined that a track is defective.

It is important to remember that the surface analysis and write home address tests will destroy any data on the tracks being tested. This also includes the format track for the cylinder in which the tested tracks are located. The verify addresses test does not destroy any data that may be on the file.

6.02.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package description apply to this program, in addition the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROG.

- a. Write Format Switch ON (on every 1301 to be tested)
- b. HAO Switch ON
- c. All 1301 modules not to be tested are set inoperative.
- d. All other 7631-1301 switches OFF.

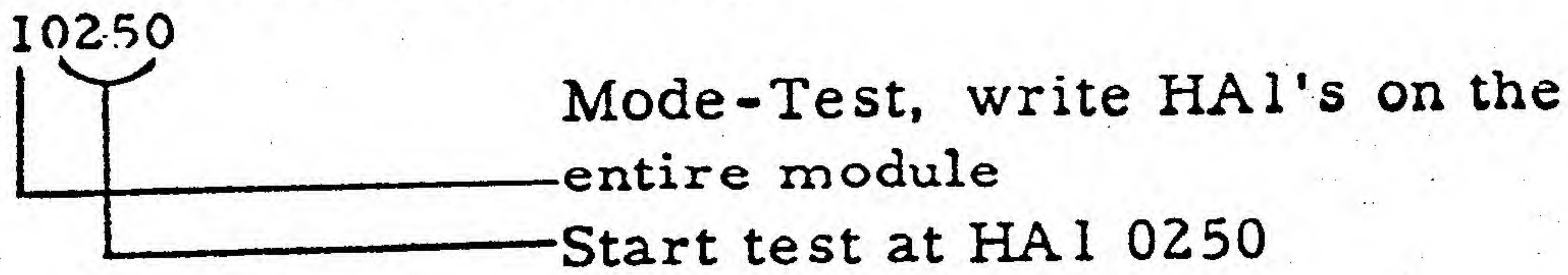
CAUTION: THIS PROGRAM CAN DESTROY CUSTOMER DATA AND/OR FORMATS.

6.02.01.0 OPERATING PROCEDURE (continued)

01.2 SPECIAL REQUESTS

- a. "Sel Mode" (CE enters on the typewriter one of 15 mode-test variations plus the four digit HAL at which the program should start operating.)

ex. 10250



0014

00014

The codes for the 15 Mode-Test variations

Test	MODE			One Surface
	Entire Mod.	One Cyl.	One Track	
Write HAL's and verify addr's	1	A	J	I
Verify addr's	2	B	K	S
Analyze surfaces	3	C	L	T
Write HAL's, analyze surfaces and verify addr.	4	D	M	U
Analyze surfaces and verify addr.	5	E	N	V

- b. "Testing Mod Ch " (If the module number and channel are correct, the CE should enter a 1. If it is not a module which is to be tested, a 1 (any character other than 1) is entered and another module is selected.)
- c. "CE-HAO ON"
This request is followed by a halt so that the switch on the 7631 may be turned on. Press start to continue.
- d. "CE-HAO OFF"
This request is followed by a halt so that the switch on the 7631 may be turned off. Press start to continue.
- e. "TRCK FLGD OK"
This typeout occurs after a successful flagging operation. The CE must now select any one of the standard program options.

Note:

Reference Operating Hints for rules of selecting modes and starting HAL address.

6.02.01.0 OPERATING PROCEDURE (continued)

01.3 SPECIAL TADS

There is one special TAD for this program (Memory Location 01004).

If this TAD is set to a 1, the verify address test will cause all failing addresses to be read from the file and displayed on the typewriter. This TAD is set to 1 when the program is loaded.

01.4 PROCEDURE TO FLAG-A-TRACK

In order to Flag-A-Track, the following procedure should be used.

- a. Load DA01
- b. When the Select Mode Request is made, enter Kxxxx
(Address of track to be flagged)
- c. Immediately after ~~selecting mode~~, press Inquiry Request.
- d. When the request is honored, enter:

8 0200 1

Flag Track Option Code
HAL of track to be flagged
Flag Character to be used

- e. Press Release, and the program will flag the selected track.

K 3-30

first position in cylinder

warning message

01.5 STANDARD OPTIONS NOT AVAILABLE IN THIS PROGRAM

Alter routine sequence - Code 3.

6.02.02.0 OPERATING HINTS

02.1 TIMING CONSIDERATIONS

When operating in the "entire module" mode, the program requires rather large amounts of time. The following were timed on a 1410, with accelerator feature, running the entire module:

- | | |
|---|----------|
| a. Write addresses | 29 Min. |
| b. Verify addresses | 11 Min. |
| c. Analyze surfaces | 87 Min. |
| d. Write address, analyze surfaces and verify addr. | 109 Min. |
| e. Analyze surfaces and verify addresses | 91 Min. |

6.02.02.0 OPERATING HINTS (continued)

02.2 CYLINDER MODE

When running in the cylinder mode, the HAl entered must be for the lowest track in the cylinder to be tested.

02.3 ONE SURFACE

When this mode is selected, the HAl of the outermost track of the surface to be tested is entered. If the fourth surface is to be tested, HAl 0004 would be entered.

02.4 ENTIRE MODULE MODE

When this mode is selected, the first HAl in the first cylinder to be tested is entered. The program need not start at cylinder 000, it may start at any cylinder.

02.5 ALTER SPECIAL TAD

Use program option code 2 (alter memory) to alter the special TAD to a 1 or 1. Special TAD location is 01004.

6.02.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None

03.2 NORMAL STOPS

Mem Loc

Reason

5923 Wait for CE-HAO to be turned off, press Start.

5961 Wait for CE-HAO to be turned on, press Start.

7471 Test is completed, press Start to go to loader.

6.02.04.0 TYPEOUTS (Other than Request or Standard Typeouts)

Following the standard error message will be the eight-digit file address being used at the time of the error. This will be the third line of the error message.

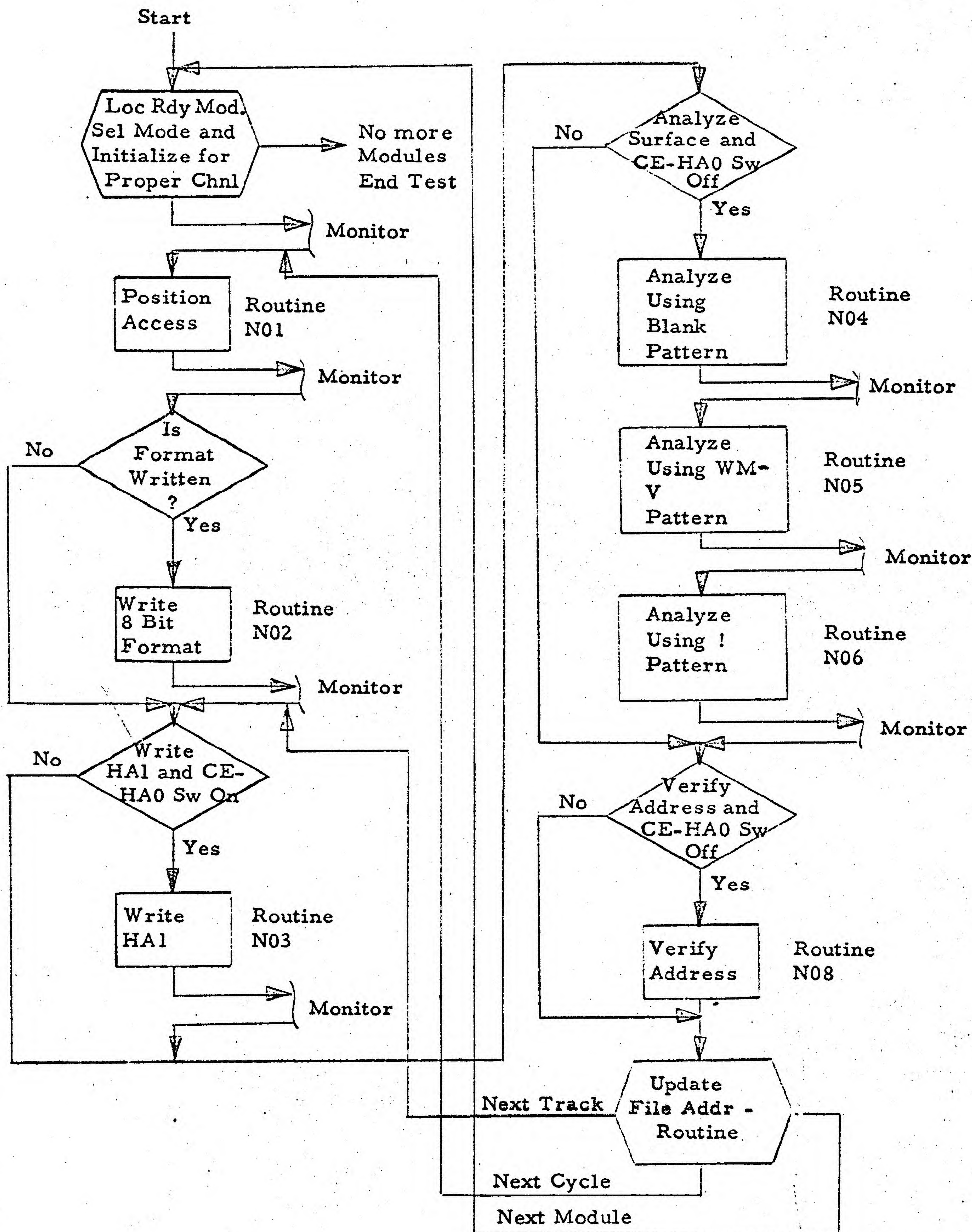
044

DA01

Page 034

6.02.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.



646
DA01

Page 036

6.02.06.0 ROUTINE/ERROR INDEX DA01

To locate routines and errors in the program listing.-

<u>Routine Number</u>	<u>Error Number</u>	<u>Page</u>
N01	01	56
N02	02	57,
N03	03	59,
N04	04	61, 62
	05	62
N05	06	63, 64
	07	64
N06	08	65, 66
	09	66
N08	10	67
N09		68
N10	11	72,
	12	73
	13	73

647

CT ADDR INSTRUCTION

I/O DICOST DEFINE TADS

OPCOD OPERAND

LABEL

PCLIN

CTL 2

DEFINE STANDARD TADS

DRG 1000

DCH 2 2

TAD0 2 2

TAD1 2 2

TAD2 2 2

TAD3

DEFINE SPECIAL TADS

DCH 2 2

SPTAD0 2 2

SPTAD1 2 2

SPTAD2 2 2

SPTAD3 2 2

SRTAD4 2 2

SPTAD5 2 2

SPTAD7 2 2

SPTAD8 2 2

SPTAD9 2 2

1002

1003

1004

1005

1006

1007

1008

1009

1010

1011

1012

1013

1014

1015

1016

1017

1018

1019

1020

1021

1022

1023

01000

1 01000

1 01001

1 01002

1 01003

1 01004

1 01005

1 01006

1 01007

1 01008

1 01009

1 01010

1 01011

1 01012

DA01
CT ADDR INSTRUCTION

I/O DICOST ONE INSTRUCTION LOOP

OPCODE OPERAND

LABEL

PGLIN

*** I/O DICOST PROGRAM ***

*** ONE INSTRUCTION LOOP ROUTINE ***

WHEN THE CE SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION
IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED. NOTE THAT THE
BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.

I/O INST BEING LUP D

10	01013	M	211	00000	R
7	01023	R	01030	H	
7	01030	J	02238	Q	
7	01037	J	01013		
1	01044	.			

MU 211.0.R

BAI 281

BNQ PRGCTL

B LOOP

H

BRCH ON INQ TO PRGCL

CONTINUE TO LOOP

1025

1026

1027

1028

1029

1030

1031

1032

1033

1034

1035

049

I/O DICOST CHANNEL ALTER

CT ADDR INSTRUCTION

PGLIN LABEL OPCODE OPERAND

1038 *** I/C DICOST PROGRAM ***

1039 *** CHANNEL ALTER ROUTINE ***

1040 THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS, BRANCH-ON-STATUS-
1041 INDICATOR-ON INSTRUCTIONS, AND BRANCH ON CHANNEL OVERLAP IN PRO-
1042 CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED. THIS IS DONE
1043 BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRU-
1044 TIONS.
1045

1046	CHALTR	SUR	X5	STORE ADDR	7	01045	G	00049	B
1047		MLCA	9EX5, X7	LOAD IX6 & IX7	12	01052	D	00+7	00059 I
1048	SCAN	SCNLA	0EX6, 0EX6	SCAN FOR WM	12	01064	D	00+0	00+0 B
1049		SAR	X6	STORE ADDR OF OPER	7	01076	G	00054	A
1050		C	X6, X7	HAS ALL OF FLD BEEN	11	01083	C	00054	00059
1051		BH	13EX5	SEARCHED IF SO BRCH	7	01094	J	00+73	U
1052		MLCS	1EX6, *E12	STORE CP CODE	12	01101	D	00+1	01124 3
1053		BCE	MLCRU, CODES,	IS OP CODE M	12	01113	B	01149	02563
1054		BCE		IS OP CODE L	1	01125	B		
1055		BCE		IS OP CODE U	1	01126	B		
1056		BCE	RX3OR1	IS OP CODE R	6	01127	B	01168	
1057		BCE		IS OP CODE X	1	01133	B		
1058		BCE		IS OP CODE 3	1	01134	B		
1059		BCE		IS OP CODE 1	1	01135	B		
1060		BCE	JAY	IS OP CODE J	6	01136	B	01187	
1061		B	SCAN	GO FIND NEXT OPER	7	01142	J	01064	
1062	PLORU	MLCS	10EX5, 2EX6	CHEANGE CH-MODE CHAP	12	01149	D	00+70	00+2 3
1063		B	SCAN	GO FIND NEXT OPER	7	01161	J	01064	
1064	RX3OR1	MLCS	11EX5, 1EX6	CHANGE B-I-S-I-C OP	12	01168	D	00+71	00+1 3
1065		B	SCAN	GO FIND NEXT OPER	7	01180	J	01064	
1066	JAY	MLCS	7EX6, *E12	STORE MODIFIER	12	01187	D	00+7	01210 3
1067		BCE	ONE234, MOOS,	IS MODIFIER A 1	12	01199	B	01221	02567
1068		BCE		IS MODIFIER A 2	1	01211	B		
1069		BCE		IS MODIFIER A 3	1	01212	B		
1070		BCE		IS MODIFIER A 4	1	01213	B		
1071		B	SCAN	GO FIND NEXT OPER	7	01214	J	01064	
1072	CNE234	MLCS	12EX5, 7EX6	CHANGE BOL MODIFIER	12	01221	D	00+72	00+7 3
1073		B	SCAN	GO FIND NEXT OPER	7	01233	J	01064	

050 APR 15

PAGE 40

DA01 INSTRUCTION

PGI.IN LABEL

I/O DICOST CHANNEL ALTER

OPCOD OPERAND

CT ADURS

1074

H

1 01240 .

1075

1076

1077

1078

1079

ORG 1233

01233

1080

DCW 2FN2FJKFJZFJ1313+92

17 01249

1081

1082

1083

DEFINE PROGRAM TITLE

1084

ORG 1250

01250

1085

DCW 2DA01D2.G

5 01254

1086

1087

1088

LOCATE THE SYSTEM & CHANNEL CARDS

1089

ORG 1256

01256

1090

SYSTEM

DC

2

2

50

01256

1091

2

2

7

01312

1092

ORG 1289

01289

1093

DC

2

2

50

01289

1094

CHNL1

DC

2

2

7

01345

1095

ORG

1346

01346

1096

DC

2

2

50

01346

1097

CHNL2

DC

2

2

7

01402

1098

ORG

1403

01403

1099

DC

2

2

50

01403

1100

CHNL3

DC

2

2

7

01459

1101

ORG

1460

01460

1102

CHNL4

DC

2

2

50

01460

1103

2

2

7

01516

1104

I/O DISK TYPE

OPCODE OPERAND

LABEL

PGLIN

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1141		CW	REPLY&1	6	01697	D 01652
1142		B	0&X1	7	01703	J 00040
1143	DATA	MLCWS	2&2,PASS1	12	01710	D 07585 01944 7
1144		BCE	0&13,1264,1	12	01722	B 01746 01264 1
1145		MLCWS	2&2,MONITR&7	12	01734	D 07585 02073 7
1146		MRCWG	0&9,1230	12	01746	D 01766 01230 L
1147		B	PASS1&7	7	01758	J 01951
1148		H		1	01765	.
1149		DC	2,732	3	01768	
1150		DCW	2JA	1	01769	
1151		DC	SCAN	5	01774	01064
1152		DC	2 2	1	01775	
1153		DCW	2,2,0,G	1	01776	
1154		DS	12		01789	

*** ERROR TABLES THESE ARE USED FOR ERROR ***

*** SUMMARIES AND ERROR IDENTIFICATION ***

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1155		ORG	0&X00		01800	
1156		ORG	0&1		01801	
1157		DCH	2LA	1	01801	
1158	STPTAB	DC	2 2	1	01802	
1159	E1		2 2	1	01803	
1160	E2		2 2	1	01804	
1161	E3		2 2	1	01805	
1162	E4		2 2	1	01806	
1163	E5		2 2	1	01807	
1164	E6		2 2	1	01808	
1165	E7		2 2	1	01809	
1166	E8		2 2	1	01810	
1167	E9		2 2	1	01811	
1168	E10		2 2	1	01812	
1169	E11		2 2	1	01813	
1170	E12		2 2	1	01814	
1171	E13		2 2	1	01815	
1172	E14		2 2	1	01816	
1173	F,5	DC	2 2	1		

053

DAO1 PAGE 43

I/O DICOST TYPE

INSTRUCTION#

CT ADDRS

PGLIN

LABEL

OPCODE OPERAND

1177	E16		2 2	1	01817
1178	E17		2 2	1	01818
1179	E18		2 2	1	01819
1180	E19		2 2	1	01820
1181	E20		2 2	1	01821
1182	E21		2 2	1	01822
1183	E22		2 2	1	01823
1184	E23		2 2	1	01824
1185	E24		2 2	1	01825
1186	E25	DC	2 2	1	01826
1187	E26	DC	2 2	1	01827
1188	E27		2 2	1	01828
1189	E28		2 2	1	01829
1190	E29		2 2	1	01830
1191	E30		2 2	1	01831
1192	E31		2 2	1	01832
1193	E32		2 2	1	01833
1194	E33		2 2	1	01834
1195	E34		2 2	1	01835
1196	E35		2 2	1	01836
1197	E36		2 2	1	01837
1198	E37		2 2	1	01838
1199	E38		2 2	1	01839
1200	E39		2 2	1	01840
1201	E40		2 2	1	01841
1202	E41		2 2	1	01842
1203	E42		2 2	1	01843
1204	E43		2 2	1	01844
1205	E44		2 2	1	01845
1206	E45		2 2	1	01846
1207	E46		2 2	1	01847
1208	E47		2 2	1	01848
1209	E48		2 2	1	01849
1210	E49		2 2	1	01850
1211	E50		2 2	1	01851
1212	E51	DC	2 2	1	01852

054

DA01

INSTRUCTION

CT	ADDRS
1	01853
1	01854
1	01855
1	01856
1	01857
1	01858
1	01859

I/O DICOST TYPE

OPCOD OPERAND

LABEL

PGLIN

1213	E52		2 2
1214	E53		2 2
1215	E54		2 2
1216	E55		2 2
1217	E56		2 2
1218	ERRTAB	DC	2+2
1219		DC	2 2
1220			

I/O DICOST INITIALIZE ROUTINE

OPCODE OPERAND

LABEL

PGLIN

*** INITIALIZE ROUTINE FOR THE DICOST PROGRAM ***

INITLE

PRINT TITLE

WCP 1250

BCB1 *-16

BAL *61

CS 99

SW 25

MLCS 2*2,100

MRWR 25,30

MRCWG RESUME,1

MRCWG INTR,101

PASS1

B DATA

CW LPRT,SW1161

CS 656

MLCWS 212,STPTAB

B START

CLEAR AND RESET

ERROR TABLE

GO TO ROUTINE INIT.

H

ORG 2000

B INITLE

*** RESET & INTERRUPT ROUTINES, THESE ROUTINES ***

*** ARE MOVED TO LOCATIONS 1 & 101

RETURN TO PROG CNTRL

BNQ PRGCTL

DCW 212

B CKLUP

DCW 212

BW MONITR,LPRT

BW LOOP,LPINST

MLNA X3,X2

B MONITR67

CHECK FOR LOOP ROUT

CHECK INST LOOP SW

LOAD IX 2

GO TO MONITR

10	01860	M	XTO	01250	H
7	01870	R	01860	2	
7	01877	R	01884	H	
6	01884	/	00099		
6	01890	.	00025		
12	01896	D	07586	00100	3
12	01908	D	00025	00030	2
12	01920	D	02015	00001	D
12	01932	D	02007	00101	D
7	01944	J	01710		
11	01951	H	02575	01549	
6	01962	/	01857		
12	01968	D	07587	01801	7
7	01980	J	03377		
1	01987	.			
	02000				
7	02000	J	01860		
7	02007	J	02238	Q	
1	02014				
7	02015	J	02023		
1	02022				
12	02023	V	02066	02575	1
12	02035	V	01013	02576	1
12	02047	D	00039	00034	/
7	02059	J	02073		

I/O DICOST MONITOR

DA01

CT ADDR INSTRUCTION

PGLIN

LABEL

OPCODE OPERAND

1253 *** I/O DICOST PROGRAM ***

1254 *** MONITOR ROUTINE ***

1255 THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED, OR

1256 A STATUS ERROR HAS BEEN DETECTED AND INDICATED. IN THE CASE OF A

1257 STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH

1258 THE STATUS ERROR WAS DETECTED. WHEN ENTERED FROM THE END OF A

1259 TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY, THE

1260 ROUTINE IS BEING LOOPEL, ANY ERRORS OCCURED, ALTER ROUTINE SEQUENCE

1261 IS SELECTED, OR THE NEXT SEQUENTIAL ROUTINE SHOULD BE RUN.

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1253						
1254						
1255						
1256						
1257						
1258						
1259						
1260						
1261						
1262						
1263	MONLTR	SDR	X2	7	02066	G 00034 B
1264		BXPA	*81	7	02073	Y 02080 X
1265		BNQ	PRGCTL	7	02080	J 02238 Q
1266	MONLTR1	BW	06X3,LPRT	12	02087	V 00000 02575 1
1267	MONLTR2	MLCWS	20,224	12	02099	D 07588 00224 7
1268		B	BRRCTL	7	02111	J 02635
1269	MONLTR3	NOP		1	02118	N
1270		MLCWA	X2,X3	12	02119	D 00034 00039 X
1271		MLCWS	2 2,224	12	02131	D 07589 00224 7
1272		B	06X2	7	02143	J 00000
1273	WHERE2	MLCWS	2 2,224	12	02150	D 07589 00224 7
1274		BCE	*88,06X2,N	12	02162	B 02181 00000 N
1275		B	06X2	7	02174	J 00000
1276		BZN	*88,16X2,2	12	02181	V 02200 00001 2
1277		B	06X2	7	02193	J 00000
1278		BZN	*88,26X2,2	12	02200	V 02219 00002 2
1279		B	06X2	7	02212	J 00000
1280		BW	MONLTR3,36X2	12	02219	V 02118 00003 1
1281		B	06X2	7	02231	J 00000
1282						

I/O DICOST PROGRAM CONTROL

 DA01
 CT ADDR INSTRUCTION

*** I/O DICOST PROGRAM ***

*** PROGRAM CONTROL ***

WHEN THE CB PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
 THIS ROUTINE IS ENTERED. THE CE ENTERS ON THE TYPEWRITER THE
 OPTION CODE DESIRED, ALONG WITH THE DATA NEEDED BY THE OPTION. THE
 ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
 THE OPTION.

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1284				10	02238	L XTO 00201 R
1285				7	02248	G 00029 B
1286				7	02255	R 02238 M
1287				6	02262	00202 G
1288				7	02268	R 02275 M
1289				11	02275	02575 02576
1290				12	02286	0 02297 01802 4
1291				12	02298	0 01802 01803 3
1292				12	02310	0 00201 02333 3
1293				12	02322	8 07429 02574
1294				6	02334	8 02389
1295				6	02340	8 02412
1296				6	02346	8 02459
1297				6	02352	8 02488
1298				6	02358	8 02522
1299				6	02364	8 02545
1300				12	02370	8 06127 00201 8
1301				7	02382	J 02238
1302				12	02389	D 00205 01003 1
1303				11	02401	/ 02087 00299
1304				12	02412	D 00206 02432 1
1305				10	02424	L XTO 00000 R
1306				7	02434	R 02424 M
1307				7	02441	R 02448 M
1308				11	02448	/ 02087 00299
1309				6	02459	02575
1310				12	02465	D 00206 00034 /
1311				11	02477	/ 02099 00299
1312						
1313						
1314						
1315						
1316						
1317						
1318						
1319						

I/O DICOST PROGRAM CONTROL

DA01

CT ADDR INSTRUCTION

PGLIN

LABEL

OPCODE OPERAND

1320	ONEUP	SW	LPINST	TURN ON LOOP INST SW	6	02488	02576
1321	LUPINT	NOPM		THIS SW IS TURNED ON	1	02494	N
1322		B	*68	BY ERRCIL	7	02495	J 02509
1323		B	PREP	GO TO PREPARE ROUT	7	02502	J 06580
1324		CW	LUPINT&1	TURN OFF SW	6	02509	02495
1325		B	LOOP		7	02515	J 01013
1326	RSTART	MLNA	CTLFLD&5,X2	LOAD IND REG2	12	02522	D 00206 00034 /
1327		CS	MONIT2,299	CLEAR CNTRL FLD	11	02534	/ 02099 00299
1328	CONT.	CS	WHERE2,299	CLR CNTL FLD	11	02545	/ 02150 00299

I/O DICOST CONSTANTS

1329							
1330							
1331	CODES	DCW	2J13XRULM2		8	02563	
1332	MODS	DCW	243212		4	02567	
1333		DCW	272		1	02568	
1334		DC	262		1	02569	
1335			252		1	02570	
1336			242		1	02571	
1337			222		1	02572	
1338			212		1	02573	
1339	CTLCOD		22		1	02574	
1340	LPRF	DC	22		1	02575	
1341	LPINST	DC	22		1	02576	
1342	ADDR02	DCW	ERRTAB	ADDR OF ERR TABLE	5	02581	01858
1343	ERR	DCW	2*ERROR2		6	02587	
1344	ACTION	DC	2REQ ERROR ACTION2,G		16	02588	
1345	ERCODE	DCW	2547P2		4	02608	
1346	SAVIND	DCW	21 2 4 8 A B2,G		11	02609	
1347	STIND	DC	21 2 4 8 A B2,G		11	02621	
1348	NOERSW	DC	22		2	02633	
1349							

I/O DICOST ERROR CONTROL

DA01 INSTRUCTION

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1387						
1388						
1389						
1390						
1391						
1392						
1393						
1394						
1395						
1396						
1397						
1398						
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1417						
1418						
1419						
1420						
1421						
1422						

NINE TIMES

CLEAR WM S

LOAD PRINT FIELD WITH ERROR MSG

BRCH IF BYPASSING ERRORS

BRCH IF NO ERRORS

RESET ERROR SW

MOVE ERROR

MOVE ROUTINE IDENT

GO TYPE ROUTINE ID

ROUTINE @

DC @ @G

BTYPES

TYPE ADDITIONAL ERROR INFORMATION

NOPTM

WCP DATA

BCBL *-16

BAI *E1

CW EXTRA@1

BCE *E8,1001,1

B WHERE2

SW LUPINT@1

MRCNG ACTION,201

B TYES

B PRGCTL

PRINT EXTRA DATA

LOOP ACTION REQUIRED

TURN ON SWITCH

MOVE ACTION MSG

*** L/O DICOST PROGRAM ***

*** DETERMINE WHICH STATUS INDICATORS ARE ON ***

THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON, ON THE

CHANNEL BEING USED. THE INDICATORS FOUND ON ARE STORED IN THE

PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.

STACHK SBR X5 STORE ADDR IN IND 5

SBR X2

BW O&X2,LPRT

S @7@,X5

REDUCE ADDR BY 7

7	03063	G	00049	B
7	03070	G	00034	B
12	03077	V	00000	02575 1
11	03089	S	07597	00049

061

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I/O DICOST ERROR CONTROL

DA01

CT ADDR INSTRUCTION

PGLIN LABEL

OPCOD OPERAND

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
1423		MLCS	0EX5,LOOP&10	12	03100	D 00#0 01023 3
1424		MRCWG	STIND,237	12	03112	D 02621 00237 L
1425		MLCS	0EX5,NUOPCO	12	03124	D 00#0 03154 3
1426		B	CHALTR	7	03136	J 01045
1427		DCW	CNTERR	5	03147	03309
1428		DC	NOTROY	5	03152	03167
1429		DCW	a a	1	03153	
1430	NUOPCO	DC	a a	1	03154	
1431		DC	a a	1	03155	
1432		ZA	200237a,X5	11	03156	Q 07602 00049
1433	NOTROY	NOP		1	03167	N
1434		BNR1	CNTERR	7	03168	R 03309 1
1435		B	UPIX	7	03175	J 03340
1436	BUSY	NOP		1	03182	N
1437		BCB1	CNTERR	7	03183	R 03309 2
1438		B	UPIX	7	03190	J 03340
1439	DATAACK	NOP		1	03197	N
1440		BER1	CNTERR	7	03198	R 03309 4
1441		B	UPIX	7	03205	J 03340
1442	EXTCND	NOP		1	03212	N
1443		BEF1	CNTERR	7	03213	R 03309 8
1444		B	UPIX	7	03220	J 03340
1445	NOTRNS	NOP		1	03227	N
1446		BNT1	CNTERR	7	03228	R 03309 B
1447		B	UPIX	7	03235	J 03340
1448	WLR	NOP		1	03242	N
1449		BW11	CNTERR	7	03243	R 03309 -
1450		B	UPIX	7	03250	J 03340
1451		SW	NOTROY&1,BUSY&1	11	03257	, 03168 03183
1452		SW	DATAACK&1,EXTCND&1	11	03268	, 03198 03213
1453		SW	NOTRNS&1,WLR&1	11	03279	, 03228 03243
1454		MRCG	237,SAVIND	12	03290	D 00237 02609 \$
1455		B	ERRCTL	7	03302	J 02635
1456	CNTERR	SBR	X6	7	03309	G 00054 8
1457		A	27a,X6	11	03316	A 07597 00054
1458		CW	ERROSW&1	6	03327	0 02913

L/O DICOSY ERROR CONTROL

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1459		B	UPIX619	7	03333	J 03359
1460	UPIX	SBR	X6	7	03340	G 00054 B
1461		MLCS	2 2.06XS	12	03347	D 07509 00640 3
1462		A	222.XS	11	03359	A 07603 00049
1463		B	06X6	7	03370	J 006.0
1464						

STORE RETURN ADDR
REMOVE STATUS CHAR
UPDATE IND REG 5
RETURN TO PROGRAM

063

DA01

CT ADDR INSTRUCTION

I/O DICOST SEQUENCE CONTROL

OPCOD OPERAND

LABEL

PGLIN

201

EQU

CTLFLD

1406

PST

1407

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

PGLIN

DETERMINE WHICH CHANNEL TO USE

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
1469						
1470						
1471						
1472	START	CW	CEHAD,OUT&1	11	03377	07472 04602
1473		CW	N0000&1,LAST&1	11	03388	04930 05483
1474		CW	PAS2SW&1,FILE&4	11	03399	06046 07695
1475		CW	SURFSW&1	6	03410	05508
1476		MLCA	2002,FILE&1	12	03416	D 07605 07692 T
1477		SW	FILE&1	6	03428	07692
1478		S	TRKCNT	6	03434	S 07511
1479		ZA	200002,X15	11	03440	M 07609 00099
1480		ZA	213082,X14	11	03451	M 07613 00094
1481	ONE	BCE	220,02X14,F	12	03462	B 03481 00M.O F
1482		B	UPX15	7	03474	J 03569
1483		MLCA	CODE3&X15,1STCH	12	03481	D 07605 03512 T
1484		B	CHALTR	7	03493	J 01045
1485		DCW	TOP	5	03504	07465
1486		DC	BOTTOM-1	5	03509	03512
1487		DCW		1	03510	
1488		DC		1	03511	
1489	1STCH	DC	2 2	1	03512	
1490	BOTTOM	SD	1,FILE	10	03513	M 2F0 07691 R
1491		BA1	2&1	7	03523	R 03530 M
1492		BNR1	2&8	7	03530	R 03544 1
1493		B	RIGHT1	7	03537	J 03610
1494	UP1	A	212,FILE&1	11	03544	A 07590 07692
1495		BZ	2&8	7	03555	J 03569 V
1496		B	BOTTOM	7	03562	J 03513
1497	UPX15	A	232,X15	11	03569	A 07596 00099
1498		A	2572,X14	11	03580	A 07615 00094
1499		BCE	ENDTST,X15-1,1	12	03591	B 07429 00098 1
1500		B	ONE	7	03603	J 03462
1501	RIGHT1	MLNS	FILE&1,RDYMES&11	12	03610	D 07692 03652 1
1502		MLNS	1STCH,RDYMES&15	12	03622	D 03512 03656 1
1503		B	TYP2	7	03634	J 01607
1504	RDYMES	DCW	2TESTING MOD CH 2,G	16	03641	

APR 15 1964

INITIALIZE ROUTINE

PGLIN	LABEL	OPCCD	OPERAND	REPLY AREA	CI	ADDRS	INSTRUCTION
1506		DCH	2 2,G		1	03658	
1507		BCE	FOUND1, *-13,1	BRCH IF THIS ONE IS	12	03660	B 03679 03658 1
1508		B	UPI	TO BE TESTED	7	03672	J 03544

PREPARE PRG TO RUN UNDER MODE SELECTED

FOUND1	B	TYP2				
1512	DCW	2SEL MCDE2,G			7	03679 J 01607
1513	DCW	2N 2,G			8	03693
1514	MODE	MODE1,FILE2			5	03695
1515	SW	MODE4,LOEND	SAVE ADDRESS		11	03701 , 03696 07693
1516	MLCA	MODE4,FILE2	SET FILE ADDR ADDR		12	03712 D 03699 07515
1517	MLCA	MODE4,LIMIT	SET FILE ADDR LIMIT		12	03724 D 03699 07696
1518	MLNA	CY1,MODE,2	BRCH IF CYL MODE		12	03736 D 03699 07476
1519	BZN	TRCK,MCDE,-	BRCH IF USING TRACK		12	03748 V 07668 03695
1520	BZN	SURF,MCDE,2			12	03760 V 03834 03695
1521	MLNA	200002,LIMIT	SET FILE ADDR LIMIT		12	03772 V 03821 03695
1522	B	CKCPT			7	03796 J 03845
1524	A	2402,LIMIT	DETERMINE HIGH LIMIT		11	03803 A 07617 07476
1525	B	CKCPT			7	03814 J 03845
1526	SW	SURFSW1	SET SWITCH TO TEST ONE SWITCH		6	03821 , 05508
1527	B	CKCPT			7	03827 J 03845
1528	A	212,LIMIT	DETERMINE HIGH LIMIT		11	03834 A 07590 07476
1529	MLNS	MODE,OPTNSH	STORE OPTION SELECTD		12	03845 D 03695 07484
1530	BCE	CESWON,OPTNSH,1	WILL HAI BE WRITTEN		12	03857 B 05936 07484
1531	BCE	CESWON,OPTNSH,4	WILL HAI BE WRITTEN		12	03869 B 05936 07484
1532	B	MONTR	GO TO MONITER		7	03881 J 02066

GO TO MONITOR

CT ADDR INSTRUCTION

PGLIN	LABEL
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OPCCD CPERAND

[illegible]

*** POSITION THE ACCESS ***

THIS ROUTINE SEEKS THE ACCESS TO THE LATEST TRACK AND HEAD ADDRESS BEING USED, IT SHOULD BE POINTED OUT THAT THIS ROUTINE IS BYPASSED WHEN THE ADDRESS CHANGE DOES NOT REQUIRE THE ACCESS TO BE MOVED. AFTER THE SEEK OPERATION A READ HAD IS ISSUED, THIS READ IS GIVEN ONLY IF THE CE-HAD SWITCH IS OFF, IF THE READ OPERATION RESULTS IN A NO RECORD FOUND, ERROR 1 IS INDICATED. ALL STATUS ERRORS ARE ALSO INDICATED.

NOI

NCP

2012

ROUTINE INDENT

1. FILE

POSITION THE ACC

91-3

BRCH ON ANY ERROR

STACHK

BRCH ON ANY ERROR
BRCH IF CE-HAO IS ON

NOIXIT, CEHAD

BRCH IF CE-HAO IS O
VERIFY THAT ACC HAS

%F5, FILE, R

VERIFY THAT AC
ARRIVED AT THE

t-16

ARRIVED AT THE
CORRECT ADDR

134

CORRECT ADDR
BRCH EXT COND OR NT

438, V

NOIXIT

*** SET ERROR I ON ***

MS

SET ERROR 1 ON

三

ACCESS POSITIONED INCORRECTLY. READ OP CAUSES NO RECORD FOUND.

NOXIT

B

MONITOR

1	03888	N			
2	03890				
10	03891	M	XF0	07691	R
7	03901	R	03891	2	G
7	03908	R	03063	M	
12	03915	V	03971	07472	1
10	03927	L	XF5	07691	R
7	03937	R	03927	2	G
7	03944	R	03951	M	
7	03951	R	03965	Y	
7	03958	J	03971		
6	03965			01802	
7	03971	J	02066		

WRITE FORMAT FOR MAXIMUM LENGTH

PAGE 58

DA01

PGLIN

LABEL

OPCODE OPERAND

CT ADDR INSTRUCTION

1597 WRITE CHECK OF FORMAT RESULTS IN DATA CHECK

1598 NO2XIT B MONITOR

7 04153 J 02066

1599

069

WRITE THE HOME ADDR & CHECK IT

CT ADDR INSTRUCTION

PGLIN LABEL OPCOD OPERAND

1601 *** TEST ROUTINE DESCRIPTION ***
1602 *** WRITE THE HOME ADDRESS 1 AND CHECK IT ***
1603 WHEN THE WRITE ADDRESS MODE IS BEING USED AND THE CE-HAO SWITCH
1604 IS ON THIS ROUTINE WRITES HA1&2.THE ROUTINE ASSUMES THE ACCESS IS
1605 PROPERLY POSITIONED FOR WRITTING THE ADDRESS,AFTER WRITTING HAO
1606 A READ HAO BRINGS THE WRITTEN HA1 BACK INTO MEMORY.THE ADDRESS
1607 READ IS CHECKED IN MEMORY,IF IT DOESN T COMPARE WITH THE ADDRESS
1608 WRITTEN ERROR 3 IS INDICATED.STATUS ERRORS WILL ALSO BE INDICATED

FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2

DATA FIELD USED WRITE AND READ IN 8 BIT MODE

0000888 THE FIRST 4 ZEROS ARE HA1,THE FIRST 8 BIT IS THE FLAG

1615	NQ3	NOP			1	04162	N
1616	DC	0030		ROUTINE IDENT	2	04164	
1617	BBE	N03XIT,OPTNSW,2		IS ROUTINE USED	12	04165	H 04341 07484 2
1618	BCE	N03XIT,OPTNSW,5		IS ROUTINE USED	12	04177	B 04341 07484 5
1619	BH	048,CEHAO		IS CE-HAO SW ON	12	04189	V 04208 07472 1
1620	B	N03XIT			7	04201	J 04341
1621	MLCHS	048,DATAFDE&2210		SET TERMINATING WMGM	12	04208	D 07588 09910 7
1622	MRCG	FILE&2,DATAFD		MOVE ADDR TO DATAFD	12	04220	D 07693 07700 3
1623	MLCS	000,DATAFDE&6		MOVE IN HA2 CHAR	12	04232	D 07619 07706 3
1624	CW	WLR&1		TURN OFF WLR CHECK	6	04244	H 03243
1625	LU	0F5,FILE,W		WRITE HOME ADDR	10	04250	L 0F5 07691 W
1626	BCB1	0-16			7	04260	R 04250 2 G
1627	BA1	0&1			7	04267	R 04274 M S
1628	BEX1	STACHK,M		BRCH ANY BUT WLR	7	04274	R 03063 M
1629	CS	DATAFDE&22		CLEAR DATA FLD	6	04281	/ 07722
1630	LU	0F5,FILE,R		READ THW HOME ADDR	10	04287	L 0F5 07691 R
1631	BA1	0&1			7	04297	R 04304 M S
1632	BEX1	STACHK,M		BRCH ANY BUT WLR	7	04304	R 03063 M
1633	SW	WLR&1		TURN ON WLR CHECK	6	04311	0 03243
1634	C	DATAFDE&5,FILE&7		IS THE ADDR GOOD	11	04317	C 07705 07698
1635	BE	0&7		IF TI SI BRCH	7	04328	J 04341 S

*** SET ERROR 3 ON ***

1636

010

CT ADDR INSTRUCTION

DAOI

WRITE THE HOME ADDR & CHECK IT
LABEL. OPCODE OPERAND

1637 SW E3 TURN ON ERROR
1638 ADDRESS READ BACK DOES NOT COMPARE TO ADDRESS WRITTEN
1639 NO3X17 B HONITR
1640

6 04335 , 01804
7 04341 J 02066

071

CT ADDR INSTRUCTION

ANALYZE DISK SURFACE FOR DEFECTS

OPCOD OPERAND

LABEL

PGLIN

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1642 *** TEST ROUTINE DESCRIPTION ***
1643 *** USE BLANKS TO ANALYZE SURFACE ***
1644 THIS ROUTINE WRITES A MAXIMUM RECORD OF BLANKS IN THE 8 BIT
1645 MODE, THE RECORD ACTUALLY BEING THE HA2 AREA, THE RECORD IS READ
1646 BACK AND CHECKED IN MEMORY. IF THE RECORD IS NOT ALL BLANKS THE
1647 PROGRAM BRANCHES TO ROUTINE NO7 WHERE EACH CHARACTER IS CHECKED
1648 UNTIL THE FAILING CHARACTER IS LOCATED. THE PROGRAM RETURNS TO
1649 THIS ROUTINE AND THE RECORD IS WRITTEN AND READ AGAIN. IF THE READ
1650 DATA IS GOOD ON THE 2ND PASS ERROR 5 IS INDICATED, THIS WOULD BE A
1651 SOFT ERROR AND DOES NOT INDICATE A DEFECTIVE SURFACE. IF THE 2ND
1652 PASS READ DATA IS BAD, THE PROGRAM ONCE MORE BRANCHES TO ROUTINE
1653 NO7 FOR A CHARACTER BY CHARACTER CHECK. IF THE FAILING CHARACTER
1654 LOCATION IN RECORD IS THE SAME AS THE FIRST PASS, ERROR 4 IS
1655 INDICATED. THIS WOULD BE A SOLID ERROR AND A STRONG INDICATION OF
1656 A DEFECTIVE TRACK. IF THE FAILING CHARACTER IS NOT THE SAME AS THE
1657 FIRST PASS ERROR 5 WOULD BE INDICATED. ALL STATUS ERRORS BUT WRONG
1658 LENGTH RECORD WILL ALSO BE INDICATED.
1659 FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
1660

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DATA FIELD USED IN 8 BIT MODE
2205 BLANKS THE ENTIRE FIELD IS HA2

PART I USE BLANKS TO ANALYZE SURFACE

NO4	NOP			1	04348	N
	DC	0040	ROUTINE IDENT	2	04350	
	BCE	N06XIT,OPTNSH,1	IS THIS ROUTINE USED	12	04351	B 05282 07484 1
	BCE	N06XIT,OPTNSH,2	IS THIS ROUTINE USED	12	04363	B 05282 07484 2
	BW	N06XIT,CEHA0	IS THE CE-HAO SW ON	12	04375	V 05282 07472 1
	CW	HLR01	TURN OFF HLR CHECK	6	04387	0 03243
	SW	DATAFD		6	04393	0 07700
IN	ZA	ADDR2,X10	LOAD IX 10	11	04399	H 07572 00074
CLEAN	CS	00X10	CLEAR	6	04410	/ 00000
	SBR	X10	OUT	7	04416	G 00074 8
	BW	CLEAN,DATAFD	THE DATA FLD	12	04423	V 04410 07700 1

ANALYZE DISK SURFACE FOR DEFECTS

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1678		MLCWS	2ND, DATAFD&2205	12	04435	D 07588 09905 7
1679		MLCS	2, TSTBIT	12	04447	D 07589 07509 3
1680		LU	EF5, FILE, W	10	04459	L 2F5 07691 W
1681		BCB1	16	7	04469	R 04459 2 G
1682		BA1	61	7	04476	R 04483 M
1683		BEX1	STACHK, M	7	04483	R 03063 M
1684		LU	2F5, FILE, R	10	04490	L 2F5 07691 R
1685		BA1	61	7	04500	R 04507 M
1686		BEX1	STACHK, M	7	04507	R 03063 M
1687		SW	DATAFD, WLR&1	11	04514	07700 03243
1688		C	DATAFD&2204, DATAFD&2203	11	04525	C 09904 09903
1689			CHECK THE DATA FLD IN MEMORY			
1690		BE	FIRST	7	04536	J 04570 S
1691		B	CHARCK	7	04543	J 05977
1692		B	IN	7	04550	J 04393
1693			*** SET ERROR 4 ON ***			
1694		SW	E4	6	04557	01805
1695			TURN ON ERROR IND			
1696			ON 2 PASSES THE SAME CHARACTER LOCATION FAILED, PROBABLY DEFECTIVE			
1697			SURFACE			
1698	FIRST	BW	68, PAS2SW&1	7	04563	J 04601
1699		B	OUT	12	04570	V 04589 06046 1
1700		CW	PAS2SW&1	7	04582	J 04601
1701			TURN OFF PASS SW	6	04589	06046
1702		SW	E5	6	04595	01806
1703			TURN ON ERROR IND			
1704	OUT	NOPWM		1	04601	N
1705		B	ALTRK	7	04602	J 06471
1706	NQ4XLT	B	MONITR	7	04609	J 02066

PART II USE V TO ANALYZE SURFACE

*** TEST ROUTINE DESCRIPTION ***
 *** USE WORD MARK V TO ANALYZE SURFACE ***
 THIS ROUTINE FUNCTIONS IN THE SAME WAY AS ROUTINE N04 EXCEPT
 WORD MARK V IS USED. SINCE WORD MARKS ARE USED IT IS

ANALYZE DISK SURFACE FOR DEFECTS

CT ADDR INSTRUCTION

PGLIN LABEL OPCODE OPERAND

1714 VERY DIFFICULT TO CHECK THE DATA IN MEMORY SO A WRITE DISK CHECK
1715 IS USED TO CHECK THE DATA WRITTEN. IF A DATA CHECK RESULTS THEN
1716 THE RECORD IS READ BACK INTO MEMORY AND A CHARACTER BY CHARACTER
1717 CHECK IS MADE. THE LOCATION OF THE FAILING CHARACTER IS SAVED AND
1718 THE ROUTINE IS REPEATED. ON THE 2ND PASS IF THE WRITE CHECK DOES
1719 NOT FAIL, OR IF IT DOES BUT THE FAILING CHARACTER LOCATION IS NOT
1720 THE SAME AS THE FIRST PASS, ERROR 7 IS INDICATED. IF ON THE 2ND
1721 PASS A FAILURE OF SAME CHARACTER LOCATION OCCURS, ERROR 6 IS
1722 INDICATED. THIS BEING THE SOLID ERROR. ALL STATUS ERRORS WILL ALSO
1723 BE INDICATED.

1724
1725 FORMAT REQUIRED IS THE SAME AS DESCRIBED TO ROUTINE NO2

1726
1727 DATA FIELD USED 8 BIT MODE

1728 2205 WORD MARK V S

1729	NOS	NOP	ROUTINE IDENT	1 04616	N
1730	DC	2052	TURN OFF WLR CHECK	2 04618	
1731	CM	WLR61		6 04619	D 03243
1732	ZA	ADDR2, X10	LOAD IX 10	11 04625	M 07572 00074
1733	SW	DATAFD	CLEAR	6 04636	, 07700
1734	CS	0EX10	THE	6 04642	/ 00000
1735	SBR	X10	DATA	7 04648	G 00074 B
1736	BH	CLEAN3, DATAFD	FIELD	12 04655	V 04642 07700 I
1737	SW	DATAFD		6 04667	, 07700
1738	MLCWS	2V3, DATAFD&2204	LOAD THE	12 04673	D 07620 09904 7
1739	MLCWB	DATAFD&2204, DATAFD&2203	DATA FIELD	12 04685	D 09904 09903 P
1740	MLCWS	2V3, TSTBIT	SAVE THE TEST BIT	12 04697	D 07620 07509 7
1741	MLCWS	2M3, DATAFD&2205	SET TERMINATING WMGM	12 04709	D 07588 09905 7
1742	LU	BF5, FILE, W	WRITE MA2 FULL TRCK	10 04721	L 2F5 07691 W
1743	BAL	6E1		7 04731	R 04738 H
1744	BEX1	STACHK, H	BRCH ANY BUT WLR	7 04738	R 03063 H
1745	LU	2F3, FILE, W	WRITE DISK CHECK	10 04745	L 2F3 07691 W
1746	BAL	6E1		7 04755	R 04762 H
1747	BEX1	STACHK, .	BRCH ON ANY BUT DC	7 04762	R 03063 .
1748	BER1	6E8	BRCH ON DATA CHECK	7 04769	R 04783 4

674

ANALYZE DISK SURFACE FOR DEFECTS

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1750		D	OK	7	04776	J 04962
1751		ZA	ADDR2,X10	11	04783	M 07572 00074
1752		SW	DATAFD	6	04794	, 07700
1753	CLEAN4	CS	06X1Q	6	04800	/ 00000
1754		SDR	X10	7	04806	G 00074 B
1755		BW	CLEAN4,DATAFD	12	04813	V 04800 07700 I
1756		LU	3F5,FILE,R	10	04825	L 3F5 07691 R
1757		BAL	SEL	7	04835	R 04842 M
1758		BEX1	STACHK,M	7	04842	R 03063 H
1759		SW	HLR&1	6	04849	, 03243
1760		ZA	022042,X7	11	04855	M 07624 00059
1761	CKWM	BW	0C8,DATAFD&X7	12	04866	V 04885 07XMO 1
1762		B	NOGOOD	7	04878	J 04929
1763		BCE	0E8,DATAFD&X7,V	12	04885	B 04904 07XMO V
1764		B	NOGOOD	7	04897	J 04929
1765		S	212,X7	11	04904	S 07590 00059
1766		BZ	OK	7	04915	J 04922 Y
1767		B	CKWM	7	04922	J 04866
1768	NOGOOD	NOPHH		1	04929	N
1769		B	0E14	7	04930	J 04950
1770		SW	NOGOOD&1	6	04937	, 04930
1771		B	GETRDV	7	04943	J 04625
1772		*** SET ERROR 6 ON ***			6	04950 , 01807
1773		SW	E6	TURN ON ERROR IND		
1774		ON 2 PASSES THE SAME CHARACTER LOCATION FAILED,PROBABLY DEFECTIVE				
1775	SURFACE					
1776		CW	NOGOOD&1	6	04956	H 04930
1777	OK	BW	0E8,NOGOOD&1	12	04962	V 04981 04930 1
1778		B	NO5XIT	7	04974	J 04993
1779		*** SET ERROR 7 ON ***			6	04981 , 01808
1780		SW	E7	TURN ON ERROR IND		
1781		CHARACTER LOCATION FAILED ONCE ON TWO PASSES				
1782		CH	NOGOOD&1	6	04987	H 04930
1783	NO5XIT	B	MONITR	7	04993	J 02066
1784						
1785						

PART III USE - TO ANALYZE SURFACE

045

ANALYZE DISK SURFACE FOR DEFECTS

PAGE 65

DA01

CT ADDR INSTRUCTION

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*** TEST ROUTINE DESCRIPTION ***
*** USE - TO ANALYZE SURFACE ***
THIS ROUTINE IS THE SAME AS ROUTINE NO4 EXCEPT THAT - IS USED
INSTEAD OF BLANK. SOFT ERRORS ARE INDICATED BY ERROR 9, AND TWO
SUCCESSIVE CHARACTER LOCATION FAILURES ARE INDICATED BY ERROR 8.
FOR GREATER DETAIL CHECK ROUTINE NO4 DESCRIPTION.

FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2

DATA FIELD USED

2205 EXCLAMATION POINTS -

NO6	NOP	ROUTINE IDENT	CT	ADDR	INSTRUCTION
1799	DC	2062	1	05000	N
1800	CW	WLR21	2	05002	
1801	ZA	ADDR2,X10	6	05003	03243
1802	SW	DATAFD	11	05009	07572 00074
1803	CS	06X10	6	05020	07700
1804	SBR	X10	6	05026	00000
1805	BW	CLEAN5,DATAFD	7	05032	00074 B
1806	MLCS	2,2,DATAFD2204	12	05039	05026 07700 1
1807	SW	DATAFD	12	05051	07625 09904 3
1808	MLCHB	DATAFD2204,DATAFD2203	6	05063	07700
1809	MLCS	2,2,TSYBIT	12	05069	09904 09903 P
1810	MLCHS	2,2,DATAFD2205	12	05081	07625 07509 3
1811	LU	EF5,FILE,H	12	05093	07588 09905 7
1812	BA1	061	10	05105	L 2F5 07691 H
1813	BEX1	STACHK,H	7	05115	R 05122 H
1814	ZA	ADDR2,X10	7	05122	R 03063 H
1815	SW	DATAFD	11	05129	07572 00074
1816	CS	06X10	6	05140	07700
1817	SBR	X10	6	05146	00000
1818	BW	CLEAN6,DATAFD	7	05152	00074 B
1819	LU	2F5,FILE,R	12	05159	V 05146 07700 1
1820	BA1	061	10	05171	L 2F5 07691 R
1821			7	05181	R 05188 H

ANALYZE DISK SURFACE FOR DEFECTS

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1822		BEXL	STACHK, H	7	05188	R 03063 H
1823		SW	DATAFD, NLR&1	11	05195	, 07700 03243
1824		C	DATAFD&2204, DATAFD&2203	11	05206	C 09904 09903
1825			CHECK THE DATA FIELD IN MEMORY			
1826		BE	AOK	7	05217	J 05251 S
1827		B	CHARCK	7	05224	J 05977
1828		B	GETSET	7	05231	J 05009
1829			*** SET ERROR 8 ON ***			
1830		SW	E8	6	05238	, 01809
1831			ON 2 PASSES THE SAME CHARACTER LOCATION FAILED, PROBABLY DEFECTIVE			
1832			SURFACE			
1833		B	N06XIT	7	05244	J 05282
1834	AOK	BW	*E8, PAS2SW&1	12	05251	V 05270 06046 1
1835		B	N06XIT	7	05263	J 05282
1836		CW	PAS2SW2&1	6	05270	B 06046
1837			*** SET ERROR 9 ON ***			
1838		SW	E9	6	05276	, 01810
1839			CHARACTER LOCATION FAILED ONCE ON TWO PASSES			
1840	N06XIT	B	MONITR	7	05282	J 02066
1841						

CT	ADDRS	INSTRUCTION	DA01
00	0000	00000000	00000000
01	0001	00000000	00000000
02	0010	00000000	00000000
03	0011	00000000	00000000
04	0100	00000000	00000000
05	0101	00000000	00000000
06	0110	00000000	00000000
07	0111	00000000	00000000
08	1000	00000000	00000000
09	1001	00000000	00000000
0A	1010	00000000	00000000
0B	1011	00000000	00000000
0C	1100	00000000	00000000
0D	1101	00000000	00000000
0E	1110	00000000	00000000
0F	1111	00000000	00000000

PGLIN	LABEL	VERIFY HAL ADDRESSES	OPCOD	OPERAND
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1843 *** TEST ROUTINE DESCRIPTION ***
1844
1845 *** VERIFY THAT HAL ADDRESSES ARE CORRECT ***
1846
1847 WHEN RUNNING IN A MODE THAT USES THIS ROUTINE AND THE CE-HAO
1848 SWITCH IS OFF A READ HAO OP IS ISSUED. IF THE READ HAO OP RESULTS
1849 IN A NO RECORD FOUND, ERROR 10 IS INDICATED. IF THE ERROR OCCURS
1850 THE PROGRAM WILL REQUEST THE CE-HAO SWITCH BE TURNED ON, THE FAIL-
1851 ING ADDRESS IS THEN READ BACK INTO MEMORY AND DISPLAYED FOR
1852 ANALYSIS. ALL STATUS ERRORS ARE ALSO INDICATED.

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NOB	NOP	ROUTINE IDENT	1	05289	N
1852	DC	2082	2	05291	
1853	BCE	NO8XIT,OPTNSW,3	12	05292	B 05472 07484 3
1854	BW	NO8XIT,CEHAO	12	05304	V 05472 07472 1
1855	MLCWS	2H2,DATAFDG15	12	05316	D 07588 07715 7
1856	LU	2F5,FILE,R	10	05328	L 2F5 07691 R
1857	BCB1	*-16	7	05338	R 05328 2
1858	BAL	*E1	7	05345	R 05352 M
1859	BEX1	*E8,Y	7	05352	R 05366 Y
1860	B	NO8XIT	7	05359	J 05472
1861					
1862		*** SET ERROR 10 ON ***			
1863	SW	E10	6	05366	, 01811
1864		READ HAQ RESULTS IN A NO RECORD FOUND			
1865	BCE	*E8,SPTAD0,1	12	05372	B 05391 01004 1
1866	B	NO8XIT	7	05384	J 05472
1867	B	MONITR	7	05391	J 02066
1868	B	CESWON	7	05398	J 05936
1869	HU	2F5,FILE,R	10	05405	M 2F5 07691 R
1870	BAL	*E1	7	05415	R 05422 M
1871	SW	DATAFD	6	05422	, 07700
1872	MLCA	DATAFDG4,ADRHSGE16 MOVE FAILING ADDR	12	05428	D 07704 05463 T
1873	B	TYPI	7	05440	J 01593
1874	ADRMSC	2HAI READ IS 2.G	17	05447	
1875	B	SWOFF	7	05465	J 05897
1876	B	MONITR	7	05472	J 02066
1877					

ADDRESS UPDATE ROUTINE

PGLIN LABEL ORCOD OPERAND

*** TEST ROUTINE DESCRIPTION ***

*** FILE ADDRESS UPDATE ROUTINE ***

THIS ROUTINE UPDATES THE HAI ADDRESS IN THE FILE ADDRESS, IT DETERMINES WHEN A CYLINDER HAS BEEN COMPLETED AND WHEN ALL OF THE CUSTOMER CYLINDERS HAVE BEEN COMPLETED. WHEN A CYLINDER IS COMPLETED AND THE NEXT CYLINDER MUST BE STARTED IT INSURES THAT THE POSITION ACCESS ROUTINE IS RUN. WHEN ALL CUSTOMER CYLINDERS HAVE BEEN COMPLETED IT SETS THE FILE ADDRESS FOR THE DIAGNOSTIC CYL. IN ADDITION THIS ROUTINE CHECKS WHEN THE PROGRAM IS COMPLETED ACCORDING TO THE MODE BEING RUN, 1 TRACK, 1 CYLINDER, THE ENTIRE MOD

PGLIN	LABEL	ORCOD	OPERAND	CT	ADDR	INSTRUCTION
1879						
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1914						

PGLIN	LABEL	ADDRESS UPDATE ROUTINE		CT	ADRS	DAOI	INSTRUCTION
1915		B	N01	7	05672	J	03888
1916	SUMORE	SW	LAST2&1	6	05679	J	05483
1917		MLCA	29#002,FILE&5	12	05685	D	07639 07696 T
1918		B	N01	7	05697	J	03888
1919	TW053	SW	FILE&4	6	05704	J	07695
1920		A	212,FILE&5	11	05710	A	07590 07696
1921		BCE	ALLDUN,FILE&4,6	12	05721	B	05835 07695 6
1922		C	FILE&5,2202	11	05733	C	07696 07641
1923		BE	TW054	7	05744	J	05769 S
1924		ZA	EN03,X3	11	05751	M	07635 00039
1925		B	N03	7	05762	J	04162
1926	TW054	ZA	EN01,X3	11	05769	M	07630 00039
1927		B	N01	7	05780	J	03888
1928	UP8URF	A	2402,FILE&5	11	05787	A	07617 07696
1929		C	FILE&5,LIMIT	11	05798	C	07696 07476
1930		BE	*E8	7	05809	J	05823 S
1931		B	N01	7	05816	J	03888
1932		BW	AGAIN,CEHAD	12	05823	V	05653 07472 1
1933	ALLDUN	CW	LAST2&1,FILE&4	11	05835	M	05483 07695
1934		CW	SURFSW&1	6	05846	M	05508
1935		MLCA	LOEND,FILE&5	12	05852	D	07515 07696 T
1936		BW	*E8,CEHAD	12	05864	V	05883 07472 1
1937		B	UP1	7	05876	J	03544
1938		B	SWOFF	7	05883	J	05897
1939		B	N01	7	05890	J	03888
1940	SWOFF	SBR	OFFXIT&5	7	05897	G	05934 B
1941		B	TYP1	7	05904	J	01593
1942		DCW	2CE-HAO OFF2,G	10	05920		
1943		H		1	05922		
1944		CW	CEHAD	6	05923	M	07472
1945	OFFXIT	B	O	7	05929	J	00000
1946	CESWON	SBR	ONXIT&5	7	05936	G	05972 B
1947		B	TYP1	7	05943	J	01593
1948		DCW	2CE-HAO ON2,G	9	05958		
1949		H		1	05960		
1950		SW	CEHAD	6	05961		07472

1040

CT ADDR INSTRUCTION

7 05967 J 00000

ADDRESS UPDATE ROUTINE

OPCODE OPERAND

PCLIN LABEL

17XND 1561

CHARACTER BY CHARACTER CHECK

CT ADDR INSTRUCTION

PGLIN LABEL OPCODE OPERAND

1953 OF THE DATA FIELD

1954 *** TEST ROUTINE DESCRIPTION ***

1955 *** CHARACTER BY CHARACTER CHECK ROUTINE ***

1956 THIS ROUTINE IS USED BY ROUTINE NO4 & NO6, TWO FO THE SURFACE

1957 ANALYSIS ROUTINES. THE ROUTINE CHECKS EVERY CHARACTER IN THE REC.

1958 READ BACK FROM THE FILE, WHEN A CHARACTER IS LOCATED WHICH WAS NOT

1959 RECORDED ITS LOCATION IN THE RECORD IS STORED IN INDEX REG. 7, AND

1960 THE ROUTINE RETURNS TO THE ROUTINE THAT DISCOVERED THE FAILURE.

1961 IF THE SAME TRACK FAILS AGAIN THIS ROUTINE CHECKS EVERY CHARACTER

1962 AND WHEN IT LOCATES A FAILURE THE LOCATION IN THE RECORD IS CHECK

1963 ED AGAINST THE FIRST FAILING LOCATION. IF THE LOCATIONS ARE THE

1964 SAME A SOLID ERROR WILL BE INDICATED, IF NOT A SOFT ERROR IS IND.

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1953				1	05974	N
1954				2	05976	
1955				7	05977	G 00064 B
1956				11	05984	Q 07645 00054
1957				12	05995	D 07509 06018 3
1958				12	06007	B 06026 07X.0
1959				7	06019	J 06045
1960				12	06026	V 06045 07X.0 1
1961				7	06038	J 06077
1962				1	06045	N
1963				7	06046	J 06102
1964				11	06053	Q 00054 00069
1965				6	06064	• 06046
1966				7	06070	J 00.00
1967				11	06077	S 07590 00054
1968				7	06088	J 00.20 V
1969				7	06095	J 06007
1970				11	06102	C 00054 00069
1971				7	06113	J 00.07 S
1972				7	06120	J 00.20
1973						
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1986						

STORE RETURN ADDR

LOAD IX 6

MOVE THE TEST BIT

CHECK EACH CHAR

CHEK FOR WM

MATCH

PASS2

PASS2SW, DATAFDX6

PASS2

X6, X9

PAS2SH&1

0EX8

212, X6

20EX8

CHKONE

X6, X9

7EX8

20EX8

SAVE ADDR OF BAD CHAR

TURN ON PASS SW

REDUCE IND REG 6 BY1

BRCH ON ZERO RESULTS

GO CHECK ANOTHER CHR

SAME CHAR BAD ON

PASSES, IF SO BRCH

DIFFERENT CHAR BAD

FLAGGING ROUTINE

PGLIN	LABEL	OPCD	OPERAND
1988			*** TEST ROUTINE DESCRIPTION ***
1989			*** FLAG A DEFECTIVE TRACK ***
1990			THIS ROUTINE IS ENTERED ONLY AT THE DIRECTION OF CE, ITS PURPOSE
1991			IS TO ALLOW THE CE TO FLAG DEFECTIVE TRACKS AND TO INSURE THAT
1992			THE SELECTED ALTERNATE TRACK IS FREE OF DEFECTS. THE CE SELECTS
1993			THE ROUTINE AS A PROGRAM OPTION AND AT THE SAME TIME ENTERS THE
1994			HAI ADDRESS AND FLAG CHARACTER. THE ROUTINE POSITIONS THE ACCESS,
1995			WRITES THE HOME ADDRESS ON THE ALTERNATE TRACK PLUS A CODE CHAR-
1996			ACTER, AND WRITES THE FLAG BIT ON THE DEFECTIVE TRACK. THE CE-HAO
1997			SWITCH IS TURNED OFF AND A READ HAO IS ISSUED. IF A NO RECORD
1998			FOUND RESULTS ERROR 11 IS INDICATED. IF THE TRACK READ DOESN'T
1999			CONTAIN THE CODE CHARACTER RECORDED ON THE ALTERNATE TRACK ERROR
2000			12 IS INDICATED, THE ALTERNATE TRACK DID NOT GET SELECTED. IF
2001			EITHER ERROR 11 OR 12 OCCUR THE CE SHOULD RE-SELECT THE FLAG
2002			ROUTINE USING A DIFFERENT FLAG CHAR. IF THERE HAVE BEEN NO ERROR
2003			INDICATIONS THE ROUTINE BRANCHES TO SURFACE ANALYSIS ROUTINE NO4,
2004			THE ALTERNATE TRACK IS ANALYZED FOR DEFECTS. IF A HARD ERROR
2005			RESULTS, ERROR 13 IS INDICATED. IN THIS CASE THE CE SHOULD RESELECT
2006			THE FLAG ROUTINE USING A DIFFERENT FLAG CHARACTER. WHEN THE ROUT-
2007			INE IS COMPLETE IT REQUESTS--WHAT NEXT--THE CE AT NOW SELECTS
2008			ANY PROGRAM OPTION AVAILABLE. NORMALLY THE CONTINUE OPTION WOULD
2009			BE TAKEN. ALL STATUS ERRORS WILL BE INDICATED.
2010			
2011			
2012			NOTE EXTREME CAUTION SHOULD BE USED WHEN SELECTING A FLAG CHAR-
2013			ACTER, SO THAT AN ALTERNATE TRACK THAT IS ALL READY IN USE IS NOT
2014			SELECTED AGAIN.
2015			
2016			
2017			FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
2018			
2019			DATA FIELD USED ON ALTERNATE TRACK AND DEFECTIVE TRACK
2020			HAI-FLAG CHAR-HAZ-CODE CHARACTER CODE CHAR IS A IN POSITION 8
2021			EXAMPLE 0000888A ALTERNATE TRACK
2022			EXAMPLE 0000288N DEFECTIVE TRACK
2023			

FLAGGING ROUTINE

PGLIN	LABEL	OPCCD	CPERAND	CT	ADDRS	INSTRUCTION
2025	N10	NCP		1	06127	N
2026		DC	21C2	2	06129	
2027		MLCB	FILE65, SAVADD	12	06130	D 07696 07524 L
2028		MLCA	206, FILE66	12	06142	D 00206 07697 F
2029		SC	1, FILE	10	06154	M 2FO 07691 R
2030		BCB1	*-16	7	06164	R 06154 2
2031		BAL	*61	7	06171	R 06178 M
2032		RM	ITISON, CEHAD	12	06178	V 06203 07472 I
2033		SW	OPINSH	6	06190	, 07484
2034		B	CESWON	7	06196	J 05936
2035	ITISON	MLCB	*68, NO2XIT-31	12	06203	D 06222 04124 L
2036		DCW	2NJ2	2	06216	
2037		DC	2062302	5	06221	
2038		DC	2 2	1	06222	
2039		B	CLRFID-17	7	06223	J 03993
2040	BACHER	MLCB	NO1626, NO2XIT-31	12	06230	D 03914 04124 L
2041		BAL	*61	7	06242	R 06249 M
2042		MLCHS	2M2, DATAFD623	12	06249	D 07588 07723 7
2043		MRCG	FILE62, DATAFD	12	06261	D 07693 07700 3
2044		MLCA	2888A2, DATAFD67	12	06273	D 07649 07707 F
2045		ZA	EN10, X3	11	06285	M 07654 00039
2046		LC	2F5, FILE, W	10	06296	L 2F5 07691 W
2047		BCB1	*-16	7	06306	R 06296 2
2048		BAL	*61	7	06313	R 06320 M
2049		MLCS	FILE66, DATAFD64	12	06320	D 07697 07704 3
2050		MLCS	282, FILE66	12	06332	D 07619 07697 3
2051		MLCS	2N2, DATAFD67	12	06344	D 07585 07707 3
2052		LU	2F5, FILE, W	10	06356	L 2F5 07691 W
2053		BAL	*61	7	06366	R 06373 M
2054		B	SWCFF	7	06373	J 05897
2055		LC	2F5, FILE, R	10	06380	L 2F5 07691 R
2056		BAL	*61	7	06390	R 06397 M
2057		BEX1	*615, Y	7	06397	R 06418 Y
2058		BEX1	STACHK, 7	7	06404	R 03063 7
2059		B	HALOK	7	06411	J 06431

*** SET ERROR 11 CN ***

084

FLAGGING ROUTINE

CPCCO OPERAND

LABEL

PGLIN

2061	SW	E11	TURN ON ERROR IND	6	06418	,	01812
2062	AFTER FLAGGING DEFECTIVE TRACK AND WRITTING HAI ALTERNATE A READ						
2063	HAC OP CAUSES A NO RECCRD FOUND.						
2064	B	MONITR		7	06424	J	02066
2065	BCE	TRK,DATAFD&2,A	BRCH IF ALTER TRK SL	12	06431	B	06456 07702 A
2066	*** SET ERROR 12 CN ***						
2067	SW	E12	TURN ON ERROR IND	6	06443	,	01813
2068	AFTER FLAGGING BAD A READ OF THAT ADDRESS DOES NOT SELECT						
2069	ALTERNATE TRACK						
2070	B	MONITR	GO IND ERROR	7	06449	J	02066
2071	SW	CUT&1		6	06456	,	04602
2072	B	IN-6		7	06462	J	04387
2073	CW	CUT&1		6	06469	□	04602
2074	BW	*&8,OPINSH	BRCH IF CE SW WAS NOT ON	12	06475	V	06494 07484 I
2075	B	CESWON	GO TURN ON CE SWITCH	7	06487	J	05936
2076	CW	OPTNSW		6	06494	□	07484
2077	MLCA	SAVADD,FILE&5	RESTORE FILE ADDRESS	12	06500	Q	07524 07696 T
2078	ZA	ENC1,X2		11	06512	M	07630 00034
2079	BW	BADTRK,E4	BRCH ON HARD ERROR	12	06523	V	06560 01805 I
2080	B	TYP1		7	06535	J	01593
2081	DCW	GTK FLGD OK&2,G		10	06551		
2082	B	PRGCTL	GO TO PRG CCNTRL	7	06553	J	02238
2083	*** SET ERROR 13 CN ***						
2084	SW	E13	TURN ON ERROR IND	6	06560	,	01814
2085	SELECTED ALTERNATE TRACK APPEARS TO BE DEFECTIVE						
2086	B	MONIT2		7	06566	J	02099
2087	B	PRGCTL		7	06573	J	02238

PREPARE ONE INSTRUCTION LOOP AND DATA FIELD

CT	ADDR	DAOI	INSTRUCTION
00	0000	0000	00000000
01	0001	0001	00000001
02	0010	0010	00000010
03	0011	0011	00000011
04	0100	0100	00000100
05	0101	0101	00000101
06	0110	0110	00000110
07	0111	0111	00000111
08	1000	1000	00001000
09	1001	1001	00001001
0A	1010	1010	00001010
0B	1011	1011	00001011
0C	1100	1100	00001100
0D	1101	1101	00001101
0E	1110	1110	00001110
0F	1111	1111	00001111
10	0000	0000	00010000
11	0001	0001	00010001
12	0010	0010	00010010
13	0011	0011	00010011
14	0100	0100	00010100
15	0101	0101	00010101
16	0110	0110	00010110
17	0111	0111	00010111
18	1000	1000	00011000
19	1001	1001	00011001
1A	1010	1010	00011010
1B	1011	1011	00011011
1C	1100	1100	00011100
1D	1101	1101	00011101
1E	1110	1110	00011110
1F	1111	1111	00011111
20	0000	0000	00100000
21	0001	0001	00100001
22	0010	0010	00100010
23	0011	0011	00100011
24	0100	0100	00100100
25	0101	0101	00100101
26	0110	0110	00100110
27	0111	0111	00100111
28	1000	1000	00101000
29	1001	1001	00101001
2A	1010	1010	00101010
2B	1011	1011	00101011
2C	1100	1100	00101100
2D	1101	1101	00101101
2E	1110	1110	00101110
2F	1111	1111	00101111
30	0000	0000	00110000
31	0001	0001	00110001
32	0010	0010	00110010
33	0011	0011	00110011
34	0100	0100	00110100
35	0101	0101	00110101
36	0110	0110	00110110
37	0111	0111	00110111
38	1000	1000	00111000
39	1001	1001	00111001
3A	1010	1010	00111010
3B	1011	1011	00111011
3C	1100	1100	00111100
3D	1101	1101	00111101
3E	1110	1110	00111110
3F	1111	1111	00111111
40	0000	0000	01000000
41	0001	0001	01000001
42	0010	0010	01000010
43	0011	0011	01000011
44	0100	0100	01000100
45	0101	0101	01000101
46	0110	0110	01000110
47	0111	0111	01000111
48	1000	1000	01001000
49	1001	1001	01001001
4A	1010	1010	01001010
4B	1011	1011	01001011
4C	1100	1100	01001100
4D	1101	1101	01001101
4E	1110	1110	01001110
4F	1111	1111	01001111
50	0000	0000	01010000
51	0001	0001	01010001
52	0010	00	

PGLIN LABEL

CPCCD CPERAND

2086 *** TEST ROUTINE DESCRIPTION ***

*** PREPARE ONE INSTRUCTION LOOP AND DATA FIELD ***

*** ACCORDING TO CE REQUEST ***

WHEN THE CE SELECTS THE PROGRAM OPTION FOR CNE INSTRUCTION LOOP

ING, THIS ROUTINE TAKES THE DATA ENTERED BY THE CE AND PUILDS THE

DATA FIELD AND LOOP INSTRUCTION FROM IT. WHEN IT HAS COMPLETED

THIS IN POSITIONS THE ACCESS TO THE ADDRESS ENTERED AND BRANCHES

TO THE LCOP ROUTINE.

2094

2095	PREP	MLCA	226,RECA00	STORE	LOOP	DATA	12	06580	D	00226	07549	I
------	------	------	------------	-------	------	------	----	-------	---	-------	-------	---

2096	CS	299	CLEAR CNTL FLD

2097	7A	ADPR1.x10	LOAD IX 10	11	06598	07561	00074
2097	7A	ADPR1.x10	LOAD IX 10	11	06598	07561	00074

2098	SW	DATAED	CLEAR
------	----	--------	-------

2099 CLEANZ CS 03X10 THE

2100 SHR X10 DATA 7 06621 6 00074 B

2101
RW
CLEANZ. DATAED
FIELD
12 06628 V 06615 07700 1

2102 MICB XCTI 1-1.100P31 SET MODE & CHANNEL

2103 MCS XC111-100P33 SET SPECIFIC OPER

2104 MICS XCII 161-100P39 SET MODIFIER

2105 7A NCECHR.X8 LOAD IND REG 8

21CC	7A	NO REC. WORK	ADD NO. OF RECORDS
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
39	39	39	39
40	40	40	40
41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45
46	46	46	46
47	47	47	47
48	48	48	48
49	49	49	49
50	50	50	50
51	51	51	51
52	52	52	52
53	53	53	53
54	54	54	54
55	55	55	55
56	56	56	56
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58	58	58	58
59	59	59	59
60	60	60	60
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62	62	62	62
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64	64	64	64
65	65	65	65
66	66	66	66
67	67	67	67
68	68	68	68
69	69	69	69
70	70	70	70
71	71	71	71
72	72	72	72
73	73	73	73
74	74	74	74
75	75	75	75
76	76	76	76
77	77	77	77
78	78	78	78
79	79	79	79
80	80	80	80
81	81	81	81
82	82	82	82
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86	86	86	86
87	87	87	87
88	88	88	88
89	89	89	89
90	90	90	90
91	91	91	91
92	92	92	92
93	93	93	93
94	94	94	94
95	95	95	95
96	96	96	96
97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

21C7	A	26A.NDFCHR	INCREASE CHAR CCUNT
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
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41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45
46	46	46	46
47	47	47	47
48	48	48	48
49	49	49	49
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51	51	51	51
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53	53	53	53
54	54	54	54
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57	57	57	57
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62	62	62	62
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64	64	64	64
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69	69	69	69
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74	74	74	74
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84	84	84	84
85	85	85	85
86	86	86	86
87	87	87	87
88	88	88	88
89	89	89	89
90	90	90	90
91	91	91	91
92	92	92	92
93	93	93	93
94	94	94	94
95	95	95	95
96	96	96	96
97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

2108 M NOECHR.WORK2 RECORDS X CHARS

21C9 ZA WORK2,X9 LOAD RESULT INTC IX9

2110 MLCS NOFCHREI.DATFED 12 06731 0 07543 07700 3

2111 MLCS BOSIO, LOOP&LO ALTER B-O-S-I-O CP

2112 HICA HA2.FILE87

2113 S WORK2 RESET WORK 2

2014 MICS LOCPEL-EE2 12 06773 D 01014 06786 3

2115 SC 1-FILE POSITION THE ACC

2116 BCB1 -16

2117 BAI 481

211A	WICS	LOC#	3-0012	MOVE THE	OP CODE	12	06809	0	01016	06832	3
------	------	------	--------	----------	---------	----	-------	---	-------	-------	---

2114
RCE SRC. SPECOD.
IS THE OP CODE 1

2120
ACE TRC
IS THE CP CODE 2

2121 ACE HAD IS THE OP CODE 5

086

PREPARE ONE INSTRUCTION LOOP AND DATA FIELD

PGLIN	LABEL	OPCCD	OPERAND	CT	ADDRS	INSTRUCTION
2122		BCE	TWA	6	06845	B 07123
2123		BCE	WFC	6	06851	B 07223
2124		B	PRGCTL	7	06857	J 02238
2125	SRO	MLCA	RECADD,FILE&7	12	06864	D 07549 07698 I
2126		SW	DATAFD&X8	6	06876	, 07P00 I
2127		MRCW	DATAFD,DATAFD&1	12	06882	D 07700 07701 M
2128		MLCWS	DATA,DATAFD&X8	12	06894	D 07588 07P00 7
2129		B	LOCP&10	7	06906	J 01023
2130	TRO	S	DATA,NOFCHR	11	06913	S 07660 07542
2131		S	WORK2	6	06924	S 07562
2132		ZA	NOFREC,WORK1	11	06930	M 07538 07557
2133		M	NOFCHR,WORK2	11	06941	Q 07542 07562
2134		ZA	WORK2,X9	11	06952	M 07562 00069
2135		SW	DATAFD&X9	6	06963	, 07P#0 I
2136		MRCW	DATAFD,DATAFD&1	12	06969	D 07700 07701 M
2137		MLCWS	DATA,DATAFD&X9	12	06981	D 07588 07P#0 7
2138		B	LOCP&10	7	06993	J 01023
2139	HAO	A	DATA,X9	11	07000	A 07603 00069
2140		ZA	DATA,NOFREC,X8	11	07011	M 07665 00064
2141		SW	DATAFD&X9	6	07022	, 07P#0 I
2142		MRCW	DATAFD,DATAFD&1	12	07028	D 07700 07701 M
2143		MLCWS	DATA,DATAFD&X9	12	07040	D 07588 07P#0 7
2144		MRC	HA2-1,DATAFD	12	07052	D 07534 07700 M
2145	LOADDR	MLCA	RECADD,DATAFD&7&X8 LOAD	12	07064	D 07549 07P01 I
2146		S	DATA,NOFREC	11	07076	S 07590 07538
2147		BZ	LOCP&10	7	07087	J 01023 V
2148		A	NOFCHR,X8	11	07094	A 07542 00064
2149		A	DATA,RECADD	11	07105	A 07590 07549
2150		B	LOADDR	7	07116	J 07064
2151	TWA	SW	DATAFD&X9	6	07123	, 07P#0 I
2152		MRCW	DATAFD,DATAFD&1	12	07129	D 07700 07701 M
2153		MLCWS	DATA,DATAFD&X9	12	07141	D 07588 07P#0 7
2154		ZA	DATA,NOFREC,X8	11	07153	M 07665 00064
2155	LOADADD	MLCA	RECADD,DATAFD&5&X8	12	07164	D 07549 07P05 I
2156		S	DATA,NOFREC	11	07176	S 07590 07538
2157		BZ	LOCP&10	7	07187	J 01023 V

END TEST AND PROGRAM CONSTANTS

CT ADDR INSTRUCTION

PGLIN LABEL

OPCCD CPERAND

2182			DA01C END TEST ROUTINE			
2183			*** END TEST ROUTINE ***			
2184	ENDTSF	BCE	2000,TAD3,1	BRCH IF REPEATING	12 07429	H 02000 01003 1
2185		BW	SWCFF,CEHAO	TS CE-PAO SW ON	12 07441	V 05897 07472 1
2186		B	TYPI	GO TYPE END MSG	7 07453	J 01593
2187		DCW	APASSA,G		4 07463	
2188	TOP	H	40C	GO TO LOADER	6 07465	- 00400
2189		H			1 07471	.
2190						
2191	CEHAO	DC	a a		1 07472	
2192	LIPIT	DCW	a a		4 07476	
2193	NUCODE	DCW	27654321a		7 07483	
2194	CPINSH	DC	a a		1 07484	
2195	HAAREA	DCW	2444333333333333333333333333334a		24 07508	
2196	TSIHIT	DCW	a a		1 07509	
2197	IRKCNF	DCW	200a		2 07511	
2198	LGEND	DCW	20000a		4 07515	
2199	SAVFLG	DCW	200000a		5 07520	
2200	SAVAUD	DCW	20000a		4 07524	
2201	LPOATA	DCW	a a		1 07525	
2202		DCW	a a		1 07526	
2203	XCILL	DCW	a a		1 07527	
2204		DC	a a		1 07528	
2205	BOSIC	DCW	a a		1 07529	
2206	TKHD	DCW	a a		4 07533	
2207	FAZ	DC	a a		2 07535	
2208	NOFREC	DCW	a a		3 07538	
2209	NOFCHR	DCW	a a		4 07542	
2210		DC	a a		1 07543	
2211	RECADD	DCW	a a		6 07549	
2212	SPECCO	DCW	276521a		5 07554	
2213	WCRK1	DCW	2000a		3 07557	
2214	WORK2	DC	200000a		5 07562	
2215	ACDR1	DCW	DATAFDE2233		5 07567	09933
221	IR2	DC	P 4FDE 74		5 07572	09904
2217	CODE2	DCW	2001a		1 0757	

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END TEST AND PROGRAM CONSTANTS

CT ADDR INSTRUCTION

OPCCD OPERAND

PGLIN LABEL

2218	DCW	20X22	3	07578	
2219	DCW	20M332	3	07581	
2220	DCW	20.142	3	07584	
2221	L1ORG			07585	
2221		20Na	1	07585	
2221		20t2	1	07586	
2221		20D	1	07587	
2221		20L2	1	07588	
2221		20G	1	07588	
2221		20Ma	1	07589	
2221		204	1	07590	
2221		2012	1	07590	
2221		2002092	5	07595	
2221		2032	1	07596	
2221		2072	1	07597	
2221		2002372	5	07602	
2221		2022	1	07603	
2221		2002	2	07605	
2221		200002	4	07609	
2221		2013082	4	07613	
2221		20572	2	07615	
2221		20402	2	07617	
2221		2042	1	07618	
2221		2082	1	07619	
2221		20V2	1	07620	
2221		222042	4	07624	
2221		20.2	1	07625	
2221		N01	5	07630	03888
2221		N03	5	07635	04162
2221		209#002	4	07639	
2221		2022	2	07641	
2221		221632	4	07645	
2221		N10	5	07650	06127
2221		2888A2	4	07654	
2221		N04	5	07659	04348
2221		262	1	07660	
2221		20C0002	5	07665	
2221		2382	2	07667	

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END TEST AND PROGRAM CONSTANTS

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DA01

APR 15 1

CI ADDR INSTRUCTION

OPCCD OPERAND

LABEL

PGLIN

2222	CY1	BCE	CY2,LIMIT-2,#	BRCH IF USING CE CY1	12	07668	8	09941	07474	#
2223		B	CYL		7	07680	J	03803		
2224		ORG	7691			07691				
2225	FILE	DCW	8000000882,G		8	07691				
2226	DATAFD	DC	a a		1	07700				
2227		DS	2240			09940				
2228	CY2	SW	FILE84,LIMIT-1	SET WMS	11	09941	,	07695	07475	
2229		B	CYL		7	09952	J	03803		
2230		H			1	09959	.			
2231		END								

END OF ASSEMBLY

6.03.00.0 DA03 RELIABILITY TEST DESCRIPTION

APR 15 1964

This is an update to DA03C.. It incorporates improved and more thorough methods of testing the reliability of the 7631-1301.

The program tests every available module on every channel in an automatic or manual mode. The automatic mode requires no manual intervention and can be run from a load-and-go maintenance tape. The manual mode does require intervention and can not be run unattended.

The normal sequence of the program starts by testing the Error Detection Ckts in the 7631. This is followed by 100 random seeks and verification that the access arrived at the correct location. At the CE cylinder (253) Read, Write, and Write Format are tested in 6 and 8 bit mode, the Read-Write test being performed on each of the 40 heads. The specific file operation: home address, full track with address, full track without addresses, single record, and cylinder, are tested for both read and write in the 8 bit mode. The cylinder op is tested only when in manual mode so that its availability can be checked. If the priority feature is available, a quick check of the seek complete line is made.

This is performed on every channel for every ready 1301 module. When all modules have been tested, the test ends, if in automatic mode. If it is in manual mode, the program runs an overlap test where files and tapes on any channel are overlapped. When the overlap routine is completed, the test in manual mode is over.

6.03.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program, in addition the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

- a. Write Format Switch On (on all 1301 mods to be tested)
- b. HAO Switch ON (on all 7631's to be tested)
- c. All 1301 modules not to be tested are set inoperative.
- d. All other 7631-1301 switches OFF.

6.03.01.0 OPERATING PROCEDURE (continued)

01.2 SPECIAL REQUESTS (Made Only in the Manual Mode)

- a. "CYO Available"
CE enters 1 if it is, $\bar{1}$ if it is not. ($\bar{1}$ = any other character but 1.)
- b. "CE-HAO ON"
CE turns on CE-HAO switch and presses start. This request is made when during the random seek test the access does not arrive at the correct location. With the CE-HAO switch on the HAL is read into memory and displayed on the typewriter.
- c. "Addr Read, 0000000, CE-HAO OFF"
The CE now turns off the CE-HAO switch and presses start to continue.

01.3 SPECIAL TADS

There is one special TAD for this program (memory location 01004).

If this TAD is set to a 1, the program will run in the manual mode. This TAD is set to a 1 when the program is loaded.

01.4 STANDARD OPTIONS

All the standard program options are available in this program.

01.5 MANUAL MODE

When running in the manual mode all channels which have tapes, but do not have files should have a scratch tape loaded and ready on Drive "1". This is required for proper operation of the overlap test.

01.6 SUMMARY TYPEOUT

The summary typeout as described in the package write-up is given at the end of this test.

6.03.02.0 OPERATING HINTS02.1 SELECTING MANUAL MODE (Alter Special TAD)

Use program option code 2 (alter memory) to alter the special TAD to a 1 or $\bar{1}$. Special TAD location is 01004.

02.2 RELIABILITY RUN

To run the program in a reliability mode:

1. Run program in automatic mode.
2. Alter TADS (select option code 3) to repeat test.
3. Terminate program when desired (select option code blank).

02.3 ALTER ROUTINE SEQUENCE

If this program option is selected, care should be used to insure that the format required by certain routines is available when the routine is run in the altered sequence.

6.03.03.0 PROGRAM STOPS03.1 ERROR STOPS

None

03.2 NORMAL STOPS - Manual Mode OnlyMem LocReason

5530

Wait for CE to turn on CE-HAO switch, press start.

5614

Wait for CE to turn off CE-HAO switch, press start.

6.03.04.0 TYPEOUTS (Other Than Request or Standard Typeouts)04.1 "HAO AND FORMAT SWS ON"

This is to remind the CE that this program runs in automatic mode when loaded and that the HAO and Write Format switches must be ON.

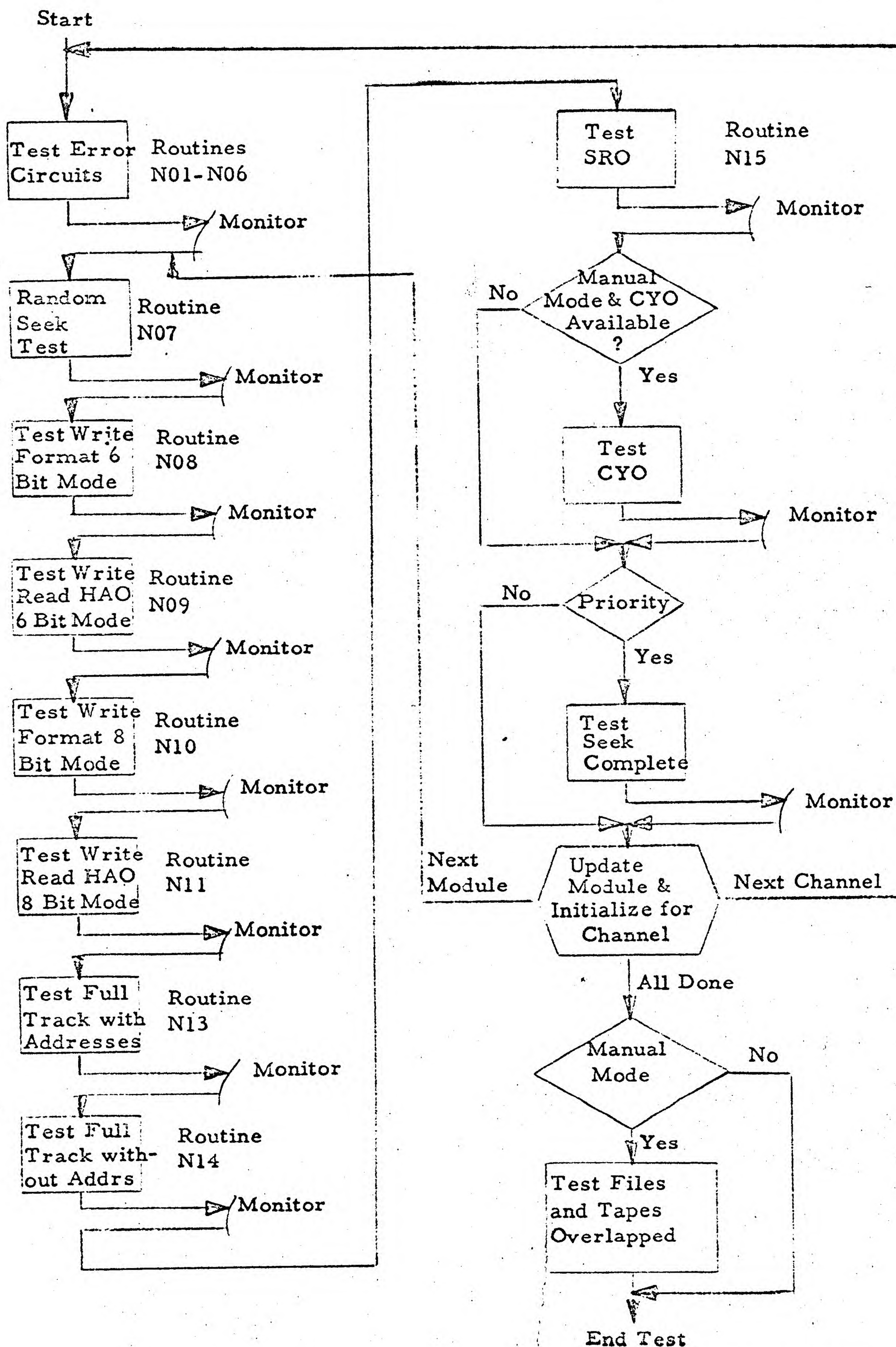
6.03.04.0 TYPEOUTS (continued)

04.2 "TST MOD CH"

This tells the CE which module on which channel is being tested at present.

6.03.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.



096

DA03

Page 085

6.03.06.0 ROUTINE/ERROR INDEX DA03

To locate routines and errors in the program listing.

<u>Routine Number</u>	<u>Error Number</u>	<u>Page</u>
N01	02	108
N02	04	109
N03	05	110, 111
	06	111
	07	111
	08	111
N04	09	113
	10	114
	11	114
N05	12	115
	13	116
	14	116
	15	116
N06	16	117
	17	117
N07	01	118
N08	18	120, 121
N09	19	122,
	20	123
N10	21	124, 125
N11	22	126,
	23	127
	24	127

6.03.06.0 ROUTINE/ERROR INDEX DA03 (continued)

<u>Routine Number</u>	<u>Error Number</u>	<u>Page</u>
N13	25	128.
N14	26	130.
N15	27	132.
	28	133
	29	133
N16	30	134, 135
N17	31	136
N18		137
N19	32	139, 140
	33	141
	34	142
	35	142

098

L/O DICOST DEFINE TADS

CT ADDR INSTRUCTION

PGLIN LABEL

ORCOD OPERAND

CTL 2

DEFINE STANDARD TADS

ORG 1000

DCW 2 2

TAD0 2 2

TAD1 2 2

TAD2 2 2

TAD3

DEFINE SPECIAL TADS

DCW 2 2

SPTAD0 2 2

SPTAD1 2 2

SPTAD2 2 2

SPTAD3 2 2

SPTAD4 2 2

SPTAD5 2 2

SPTAD7 2 2

SPTAD8 2 2

SPTAD9 2 2

01000

1 01000

1 01001

1 01002

1 01003

1 01004

1 01005

1 01006

1 01007

1 01008

1 01009

1 01010

1 01011

1 01012

I/O DICOST ONE INSTRUCTION LOOP

CT ADDR INSTRUCTION

PGLIN LABEL OPCOD OPERAND

1025 *** I/O DICOST PROGRAM ***

1026 *** ONE INSTRUCTION LOOP ROUTINE ***

1027 WHEN THE CB SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION

1028 IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED. NOTE THAT THE

1029 BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.

1030 LOOP MU S11.0.0R I/O INST BEING LUP D

1031 8A1 001

1032 8NQ PRGCTL

BRCH ON INQ TO PRGCL

1033 8 LOOP

CONTINUE TO LOOP

1034 H

1035

10	01013	M	S11	00000	R
7	01023	R	01030	M	
7	01030	J	02250	Q	
7	01037	J	01013		
1	01044	.			

1038
1039

1040 THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS, BRANCH-ON-STATUS-
1041 INDICATOR-ON INSTRUCTIONS, AND BRANCH ON CHANNEL OVERLAP IN PRO-
1042 CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED. THIS IS DONE
1043 BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUCTIONS.
1044

1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073
CHALTR		SCAN																									
SHR	MLCA	SCNLA	SAR	C	BH	MLCS	BCE	BCE	BCE	BCE	BCE	BCE	BCE	BCE	B	MLCS	B	MLCS	B	MLCS	BCE	BCE	BCE	BCE	B	MLCS	B
X5	9EX5,X7	0EX6,0EX6	X6	X6,X7	13EX5	1EX6,*E12	MLCRU, CODES,			RX3OR1				JAY	SCAN	10EX5,2EX6	SCAN	11EX5,1EX6	SCAN	7EX6,*E12	ONE234,MODS,				SCAN	12EX5,7EX6	SCAN
STORE ADDR	LOAD IX6 & IX7	SCAN FOR WM	STORE ADDR OF OPER	HAS ALL OF FLD BEEN	SEARCHED IF SO BRCH	STORE OP CODE	IS OP CODE M	IS OP CODE L	IS OP CODE U	IS OP CODE R	IS OP CODE X	IS OP CODE 3	IS OP CODE 1	IS OP CODE J	GO FIND NEXT OPER	CHANGE CH-MODE CHAR	GO FIND NEXT OPER	CHANGE B-I-S-I-C OP	GO FIND NEXT OPER	STORE MODIFIER	IS MODIFIER A 1	IS MODIFIER A 2	IS MODIFIER A 3	IS MODIFIER A 4	GO FIND NEXT OPER	CHANGE BOL MODIFIER	GO FIND NEXT OPER
7 01045	12 01052	12 01064	7 01076	11 01083	7 01094	12 01101	12 01113	1 01125	1 01126	6 01127	1 01133	1 01134	1 01135	6 01136	7 01142	12 01149	7 01161	12 01168	7 01180	12 01187	12 01199	1 01211	1 01212	1 01213	7 01214	12 01221	7 01233
G 00043 B	D 00119 00059 I	D 00110 00110 S	G 00054 A	C 00054 00059	J 00113 U	D 00111 01124 3	B 01149 02750	B	B	B 01168	B	B	B	B 01187	J 01064	D 00110 00112 3	J 01064	D 00111 00111 3	J 01064	D 00117 01210 3	B 01221 02754	B	B	B	J 01064	D 00112 00112 7 3	J 01064

PGLIN

LABEL

OPCOD OPERAND

1074

H

1 01240

1075

1076

DEFINE SYSTEM & CHANNEL CONTROL CARDS

1077

1078

1079

ORG 1233

01233

1080

DCW @FN2FJRFJZFJI301#9@

17 01249

1081

1082

DEFINE PROGRAM TITLE

1083

1084

ORG 1250

01250

1085

DCW @DA030@,G

5 01254

1086

1087

LOCATE THE SYSTEM & CHANNEL CARDS

1088

1089

ORG 1256

01256

1090

SYSTEM

DC @

@

50 01256

1091

@

@

7 01312

1092

ORG

1289

01289

1093

CHNL1

DC @

@

50 01289

1094

@

@

7 01345

1095

ORG

1346

01346

1096

CHNL2

DC @

@

50 01346

1097

@

@

7 01402

1098

ORG

1403

01403

1099

CHNL3

DC @

@

50 01403

1100

@

@

7 01459

1101

ORG

1460

01460

1102

CHNL4

DC @

@

50 01460

1103

@

@

7 01516

1104

30/

PGLIN	LABEL	I/O DICOIST TYPE	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1105		*** L/O DICOIST PROGRAM ***					
1106		*** TYPE AND REQUEST FOR INTERVENTION ***					
1107		THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR					
1108		MANUAL INTERVENTION. THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON					
1109		DATA FIELD, OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE					
1110		BRANCH INSTRUCTION TO THIS ROUTINE. IF A REPLY IS REQUIRED A READ					
1111		CONSOLE PRINTER OPERATION IS ISSUED. THIS ROUTINE IS USED TO TYPE					
1112		ALL MESSAGES IN THIS PROGRAM.					
1113							
1114		TYMES	SBR	TYPXIT15		7 01517	G 01591 B
1115		TYPE	WCP	201		10 01524	M ZTO 00201 H
1116			BCB1	TYPE		7 01534	R 01524 Z
1117			BAL	*E1		7 01541	R 01548 M
1118		SW11	NOPWM			1 01548	N
1119		LAS60	RCP	O		10 01549	M ZTO 00000 R
1120			BEX1	*--16,M		7 01559	R 01549 S
1121			BAL	*E1		7 01566	R 01573 H
1122			CW	SW11E1		6 01573	M 01549
1123			CS	330		6 01579	/ 00330
1124			CS			1 01585	/
1125		TYPXIT	B	O		7 01586	J 00000
1126		TYPI	SBR	X1		7 01593	G 00029 B
1127			B	*E14		7 01600	J 01620
1128		TYPE2	SBR	X1		7 01607	G 00029 B
1129			SW	REPLYE1		6 01614	, 01652
1130			WCP	OEX1		10 01620	M ZTO 00040 W
1131			SBR	X1		7 01630	G 00029 B
1132			BCB1	*--23		7 01637	R 01620 Z
1133			BAL	*E1		7 01644	R 01651 M
1134		REPLY	NOPWM			1 01651	N
1135			B	RDCON		7 01652	J 01666
1136			B	OEX1		7 01659	J 00040
1137		RDCON	RCP	OEX1		10 01666	M ZTO 00040 R
1138			SBR	X1		7 01676	G 00029 B
1139			BEX1	*--23,M		7 01683	R 01666 S
1140			BAL	*E1		7 01690	R 01697 H

I/O DISC TYPE

PCBIN

PCBIN

PCBIN

INSTRUCTION

CT

ADDRS

OPCODE

OPERAND

DATA

REPLY

INSTRUCTION

1141	CH	REPLY	6	01697	01652
1142	B	0EX1	7	01703	J 00040
1143	MLCWS	2N2,PASS1	12	01710	D 09572 01944 7
1144	BCE	0EX13,1264,1	12	01722	B 01746 01264 1
1145	MLCWS	2N2,MONITR67	12	01734	D 09572 02073 7
1146	MRCWG	0EX9,1230	12	01746	D 01766 01230 L
1147	B	PASS167	7	01758	J 01951
1148	H		1	01765	.
1149	DC	2.733	3	01768	
1150	DCW	2JA	1	01769	
1151	DC	SCAN	5	01774	01064
1152	DC	2 2	1	01775	
1153	DCW	2.2.0	1	01776	
1154	DS	12		01789	

*** ERROR TABLES THESE ARE USED FOR ERROR ***

*** SUMMARIES AND ERROR IDENTIFICATION ***

1158	ORG	0EX00		01800	
1159	ORG	0EX1		01801	
1160	DCW	2LA	1	01801	
1161	STPTAB				
1162	E1	2 2	1	01802	
1163	E2	2 2	1	01803	
1164	E3	2 2	1	01804	
1165	E4	2 2	1	01805	
1166	E5	2 2	1	01806	
1167	E6	2 2	1	01807	
1168	E7	2 2	1	01808	
1169	E8	2 2	1	01809	
1170	E9	2 2	1	01810	
1171	E10	2 2	1	01811	
1172	E11	2 2	1	01812	
1173	E12	2 2	1	01813	
1174	E13	2 2	1	01814	
1175	E14	2 2	1	01815	
1176	E15	2 2	1	01816	

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I/O DDCOST TYPE

CT ADDR INSTRUCTION

OPCODE OPERAND

PGLIN LABEL

1177	E16	2 2	1	01817	
1178	E17	2 2	1	01818	
1179	E18	2 2	1	01819	
1180	E19	2 2	1	01820	
1181	E20	2 2	1	01821	
1182	E21	2 2	1	01822	
1183	E22	2 2	1	01823	
1184	E23	2 2	1	01824	
1185	E24	2 2	1	01825	
1186	E25	2 2	1	01826	
1187	E26	2 2	1	01827	
1188	E27	2 2	1	01828	
1189	E28	2 2	1	01829	
1190	E29	2 2	1	01830	
1191	E30	2 2	1	01831	
1192	E31	2 2	1	01832	
1193	E32	2 2	1	01833	
1194	E33	2 2	1	01834	
1195	E34	2 2	1	01835	
1196	E35	2 2	1	01836	
1197	E36	2 2	1	01837	
1198	E37	2 2	1	01838	
1199	E38	2 2	1	01839	
1200	E39	2 2	1	01840	
1201	E40	2 2	1	01841	
1202	E41	2 2	1	01842	
1203	E42	2 2	1	01843	
1204	E43	2 2	1	01844	
1205	E44	2 2	1	01845	
1206	E45	2 2	1	01846	
1207	E46	2 2	1	01847	
1208	E47	2 2	1	01848	
1209	E48	2 2	1	01849	
1210	E49	2 2	1	01850	
1211	E50	2 2	1	01851	
1212	E51	2 2	1	01852	

DC

DC

DC

PGLIN LABEL I/O DICOBY TYPE
OPCOD OPERAND

1213 E52 2 2
1214 E53 2 2
1215 E54 2 2
1216 E55 2 2
1217 E56 2 2
1218 ERRTAB DC 0*2
1219 DC 2 2
1220

DA03 INSTRUCTION
CT ADDR

1 01853
1 01854
1 01855
1 01856
1 01857
1 01858
1 01859

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L/D DICOST INITIALIZE ROUTINE

DA03 PAGE 95

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1222	INITLE	HCP	1250	10	01860	M X10 01250 W
1223		BCBI	--16	7	01870	R 01860 2
1224		BAL	*E1	7	01877	R 01884 M
1225		CS	99	6	01884	/ 00099
1226		SW	25	6	01890	, 00025
1227		MLCS	2+2,100	12	01896	D 09573 00100 3
1228		MRWR	25,30	12	01908	D 00025 00030 2
1229		MRCWG	RESUME,1	12	01920	D 02015 00001 L
1230		MRCWG	INTR,101	12	01932	D 02007 00101 L
1231	PA691	B	DATA	7	01944	J 01710
1232		OPT2 CW	NOERSW&1	6	01951	D 02840
1233		CW	LPRT,SW11&1	11	01957	D 02764 01549
1234		OPT1 CW	SEQSW	6	01968	D 02763
1235		CS	E56	6	01974	/ 01857
1236		MLCHS	212,STPTAB	12	01980	D 09574 01801 7
1237		B	START	7	01992	J 04088
1238		H		1	01999	.
1239		ORG	2000		02000	
1240		B	INITLE	7	02000	J 01860
1241						
1242						
1243						
1244						
1245	INTR	BNQ	PRGCTL	7	02007	J 02250 Q
1246		DCW	212	1	02014	
1247	RESUME	B	CKLUP	7	02015	J 02023
1248		DCW	212	1	02022	
1249	CKLUP	BW	MONITR,LPRT	12	02023	V 02066 02764 1
1250		BW	LOOP,LPINST	12	02035	V 01013 02765 1
1251		MLNA	X3,X2	12	02047	D 00039 00034 /
1252		B	MONITR&7	7	02059	J 02073
1253						

*** INITIALIZE ROUTINE FOR THE DICOST PROGRAM ***

PRINT TITLE

RESET IND REG S

SET WM IN IND REG 1

PREPARE TO LOAD 2-15

LOAD IND REG 2-15

MOVE RESET PROCEDURE

MOVE INTERRUPT PROC

GO DO MORE INITIALIZING

TURN OFF SWITCHES

CLEAR AND RESET

ERROR TABLE

GO TO ROUTINE INIT.

*** RESET & INTERRUPT ROUTINES, THESE ROUTINES ***

*** ARE MOVED TO LOCATIONS 1 & 101

RETURN TO PROG CNTRL

CHECK FOR LOOP ROUT

CHECK INST LOOP SW

LOAD IX 2

GO TO MONITR

CT ADDR INSTRUCTIONS

1285

I/O DICOST PROGRAM CONTROL

DA03

PAGE 97

CT ADDR INSTRUCTION

```

1287 *** I/O DICOST PROGRAM ***
1288 *** PROGRAM CONTROL ***
1289 WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1290 THIS ROUTINE IS ENTERED. THE CE ENTERS ON THE TYPEWRITER THE
1291 OPTION CODE DESIRED, ALONG WITH THE DATA NEEDED BY THE OPTION. THE
1292 ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1293 THE OPTION.
1294
1295 PRGCTL RCPW CILFLO READ THE CONSOLE PRT
1296 SBR X1
1297 BEXI PRGCTL, M BRCH ON ANY BUT WLR
1298 SW CILFLO
1299 BAI *E1
1300 OPT1 CW SEQSW TURN OFF SEQ SWITCH
1301 CW LPRT, LPINST TURN OFF LOOP SWS
1302 MLWS *E1 CLEAR WM IN ERROR
1303 MRWR E1, E2 TABLE
1304 NLCS CILFLO, *E12 MOVE CTL CODE ENTERD
1305 DCE ENDTST, CTLCOD, IS CTL CODE BLANK
1306 BCE ALTADS IS CTL CODE 1
1307 BCE ALTHEN IS CTL CODE 2
1308 OPT1 BCE ALTSEQ IS CTL CODE 3
1309 BCE LUPRT IS CTL CODE 4
1310 BCE ONELUP IS CTL CODE 5
1311 BCE RSTART IS CTL CODE 6
1312 BCE CONT IS CTL CODE 7
1313 B PRGCTL
1314 ALTADS MLCA CILFLO, 4, 1003 MOVE IN NEW TADS
1315 CS MONIT1, 299 CLEAR OUT CTL FLD
1316 ALTSEM MLCA CILFLO, 5, *E9 MOVE ADDR TO BE ALTR
1317 RCPW 0 ALTER MEMORY
1318 BEXI *-16, M CHECK ALL BUT WLR
1319 BAI *E1
1320 CS MONIT1, 299 CLEAR THE CNTRL FLD
1321 ALTSEQ MLCS 2M, 0E1 SET WMGM AT END
1322 OPT1 MRCWG CILFLO, 1, SEQFLD MOVE CNTRL TO SEQ

```

CT	ADDR	INSTRUCTION
10	02250	L XTO 00201 R
7	02260	G 00029 B
7	02267	R 02250 M
6	02274	* 00202 G
7	02280	R 02287 M
6	02287	* 02763
11	02293	* 02764 02765
12	02304	D 02315 01802 4
12	02316	D 01802 01803 2
12	02328	D 00201 02351 3
12	02340	B 08392 02762
6	02352	B 02401
6	02358	B 02424
6	02364	B 02471
6	02370	B 02524
6	02376	B 02553
6	02382	B 02587
6	02388	B 02610
7	02394	J 02250
12	02401	D 00205 01003 T
11	02413	/ 02087 00299
12	02424	D 00206 02444 T
10	02436	L XTO 00000 R
7	02446	R 02436 M
7	02453	R 02460 M
11	02460	/ 02087 00299
12	02471	D 09575 00040 7
12	02483	D 00202 02633 L

I/O DICOST PROGRAM CONTROL

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PGLIN	LABEL	OPCD	OPERAND	CT	ADDRS	INSTRUCTION
1323		OPT1 SW	SEQSW	6	02495	• 02763
1324		OPT1 MLNA	SQCON1,X4	12	02501	D 02738 00044 /
1325		OPT1 CS	MONIT2,299	11	02513	/ 02099 00299
1326	LUPRT	SW	LPRT	6	02524	• 02764
1327		MLNA	CTLFLD65,X2	12	02530	D 00206 00034 /
1328		CS	MONIT2,299	11	02542	/ 02099 00299
1329	ONELUP	SW	LPINST	6	02553	• 02765
1330	LUPINT	NOPWM		1	02559	N
1331		B	*E8	7	02560	J 02574
1332		B	PREP	7	02567	J 08435
1333		CW	LUPINT&1	6	02574	□ 02560
1334		B	LOOP	7	02580	J 01013
1335	RSTART	MLNA	CTLFLD65,X2	12	02587	D 00206 00034 /
1336		CS	MONIT2,299	11	02599	/ 02099 00299
1337	CONT	CS	WHERE2,299	11	02610	/ 02162 00299

I/O DICOST CONSTANTS

1338	STACNTOPT2	DCW	2002	2	02622	
1339		OPT2	2002	2	02624	
1340		OPT2	2002	2	02626	
1341		OPT2	2002	2	02628	
1342		OPT2	2002	2	02630	
1343		OPT2	2002	2	02632	
1344		OPT2	2002	1	02633	
1345	SEQFLDOPT1	DCW	2	37	02670	
1346		OPT1 DC	2	37	02707	
1347		OPT1 DC	2	25	02732	
1348		OPT1 DC	2	5	02738	02633
1349	SQCON1OPT1	DCW	SEQFLD	4	02742	
1350	CMPFLDOPT1	DCW	2N 2	8	02750	
1351	CODES	DCW	2J13XRULM2	4	02754	
1352	MODS	DCW	243212	1	02755	
1353		DCW	272	1	02756	
1354		DC	262	1	02757	
1355			252	1	02758	
1356			242	1	02759	
1357			232			
1358						

I/O DICOST PROGRAM CONTROL

CT ADDR INSTRUCTION

PGLIN LABEL OPCODE OPERAND

1359			222	1	02760	
1360			212	1	02761	
1361	CTLCOD		2 2	1	02762	
1362	SEQSW OPT1	DC	2 2	1	02763	
1363	LPRT	DC	2 2	1	02764	
1364	LPINST	DC	2 2	1	02765	
1365	ADDR02	DCW	ERRTAB	5	02770	01858
1366	ADDR03OPT2	DCW	STACNT	5	02775	02622
1367	ERR	DCW	8*ERROR2	6	02781	
1368	ACTION	DC	2REQ ERROR ACTION2.G	16	02782	
1369	ERCODE	DCW	2547P2	4	02802	
1370	SAVIND	DCW	21 2 4 8 A B2.G	11	02803	
1371	STIND	DC	21 2 4 8 A B2.G	11	02815	
1372	STAC00OPT2	DCW	2NR2	2	02828	
1373	OPT2	DCW	2BY2	2	02830	
1374	OPT2	DCW	2DC2	2	02832	
1375	OPT2	DCW	2EC2	2	02834	
1376	OPT2	DCW	2NT2	2	02836	
1377	OPT2	DCW	2HL2	2	02838	
1378	NDERSW	DC	2 2	2	02839	
1379						

ADDR OF ERR TABLE

ADDR OF STATUS TABLE

I/O DICOST ERROR CONTROL

CT ADDR INSTRUCTION

PCLIN

LABEL

OPCOD OPERAND

*** I/O DICOST PROGRAM ***

*** ERROR CONTROL ***

THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
ED ERRORS HAVE TO BE INDICATED. IF THERE ARE THIS ROUTINE BUILDS
THE ERROR MESSAGE AND HAS IF TYPED OUT. THIS ROUTINE ALSO CHECKS
TAD 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.

LOCATE FAILING INST

PC	CT	ADDR	INSTRUCTION
1381	12	02841	D 00034 00049 T
1382	11	02853	S 09577 00049 S
1383	12	02864	D 00040 00040 B
1384	7	02876	G 00049 A
1385	12	02883	D 00041 02906 3
1386	12	02895	B 02939 02750
1387	1	02907	B
1388	6	02908	B 02958
1389	11	02914	C 00039 00049
1390	7	02925	J 02982 T
1391	7	02932	J 02853
1392	12	02939	D 00040 01022 X
1393	7	02951	J 02982
1394	12	02958	D 00045 01022 X
1395	12	02970	D 09572 01013 3
1396	12	02982	D 01022 00234 T
1397	12	02994	D 00039 00223 /
1398	6	03006	D 02840
1399	11	03012	H 02770 00029
1400	11	03023	H 09582 00049
1401	12	03034	D 00040 00040 B
1402	7	03046	G 00029 A
1403	12	03053	B 03135 00041 L
1404	6	03065	, 00028
1405	12	03071	D 00029 00040 V

LOAD IND REG 5

SCAN THE ROUTINE

STORE CHAR ADDR

MOVE CHAR TO BE CHKD

IS OP CODE M

IS OP CODE L

IS OP CODE U

HAS ROUTINE BEEN SEARCHED

GO CONTINUE THE SRCH

LOAD THE LOOP INST

LOAD THE LOOP INST

SET NO-OP FOR SHORT

INSTRUCTION

MOVE FAILING OPER

MOVE ADDR OF ROUT

TURN OFF NO ERR SW

LOAD NO REG 1

LOAD IND REG 5

SCAN ERROR TABLE & UPDATA ERROR COUNT

SCAN THE ERROR TABLE

STORE ADDR

HAS TABLE BEEN COMP.

DEFINE ERROR

MOVE ERROR CODE NO.

I/O DICOST ERROR CONTROL

PGLIN	LABEL	OPCD	OPERAND	CT	ADDRS	INSTRUCTION
1417	OPT2 A	010,10X1	UPDATE ERROR COUNT	11	03083	A 09577 000+1
1418	A	030,X5	UPDATE IND REG 5	11	03094	A 09583 00049
1419	OPT2 BCE	SUMARY,10X1,9	BRCH IF ERROR OCCURED	12	03105	B 04043 000+1 9
1420			NINE TIMES			
1421	CW	10X1,X1-1	CLEAR WM S	11	03117	M 000+1 00028
1422	B	ERSCAN		7	03128	J 03034
1423			LOAD PRINT FIELD WITH ERROR MSG			
1424	AFTSRH	BCE	WHERE2,1000,1	12	03135	B 02162 01000 1
1425	ERROSW	NOP		1	03147	N
1426	BCE	WHERE2,209	BRCH IF NO ERRORS	12	03148	B 02162 00209
1427	SW	ERROSW01	RESET ERROR SW	6	03160	, 03148
1428	MLCA	ERR,206	MOVE ERROR	12	03166	D 02781 00206 T
1429	MLCA	20X3,ROUTID	MOVE ROUTINE IDENT	12	03178	D 000H2 03207 T
1430	B	TYPE1	GO TYPE ROUTINE ID	7	03190	J 01593
1431	DCW	ROUTINE 0		8	03204	
1432	DC	0 0,0		3	03207	
1433	B	TYMES		7	03209	J 01517
1434			TYPE ADDITIONAL ERROR INFORMATION			
1435	EXTRA	NOPHM		1	03216	N
1436	WCP	DATA	PRINT EXTRA DATA	10	03217	M 010 01710 W
1437	BCB1	0-16		7	03227	R 03217 2
1438	BAL	001		7	03234	R 03241 H
1439	CW	EXTRA01		6	03241	M 03217
1440	BCE	008,1001,1	LOOP ACTION REQUIRED	12	03247	B 03266 01001 1
1441	B	WHERE2		7	03259	J 02162
1442	SW	LUPINT01	TURN ON SWITCH	6	03266	, 02560
1443	MRCWG	ACTION,201	MOVE ACTION MSG	12	03272	D 02782 00201 L
1444	B	TYMES		7	03284	J 01517
1445	B	PRGCTL		7	03291	J 02250

117
102

ERROR CONTROL-CHECK STATUS INDICATORS

DA03
INSTRUCTION

PC	INSTR	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1447	*** I/O DICOST PROGRAM ***					
1448	*** DETERMINE WHICH STATUS INDICATORS ARE ON ***					
1449	THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON, ON THE					
1450	CHANNEL BEING USED. THE INDICATORS FOUND ON ARE STORED IN THE					
1451	PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.					
1452	STACPR	SBR	X5	7	03298	G 00049 B
1453		SBR	X2	7	03305	G 00034 B
1454		BW	0&X2,LPRT	12	03312	V 000,0 02764 1
1455		S	070,X5	11	03324	S 09584 00049
1456		MLCS	0&X5,LOOP&10	12	03335	D 00040 01023 3
1457		MRCWG	STIND,237	12	03347	D 02815 00237 L
1458	ORT2 MLCA	ADDR03,X1		12	03359	D 02775 00029 T
1459	MLCS	0&X5,NUOPCO		12	03371	D 00040 03401 3
1460	B	CHALTR		7	03383	J 01045
1461	DCW	CNTERR		5	03394	03556
1462	DC	NOIRDY		5	03399	03414
1463	DCW	0 0		1	03400	
1464	DC	0 0		1	03401	
1465	DC	0 0		1	03402	
1466	ZA	0002370,X5		11	03403	Q M 09589 00049
1467	NOIRDY	NOP		1	03414	N
1468	BNRL	CNTERR		7	03415	R 03556 1
1469	B	UPIX		7	03422	J 03598
1470	BUSY	NOP		1	03429	N
1471	BCBL	CNTERR		7	03430	R 03556 2
1472	B	UPIX		7	03437	J 03598
1473	DATAACK	NOP		1	03444	N
1474	BER1	CNTERR		7	03445	R 03556 4
1475	B	UPIX		7	03452	J 03598
1476	EXTEND	NOP		1	03459	N
1477	BEFL	CNTERR		7	03460	R 03556 8
1478	B	UPIX		7	03467	J 03598
1479	NOTRNS	NOP		1	03474	N
1480	BNT1	CNTERR		7	03475	R 03556 8
1481	B	UPIX		7	03482	J 03598
1482	MLR	NOP		1	03489	N

ERROR CONTROL-CHECK STATUS INDICATORS

DA03 PAGE 103

PCLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1483		BWLI	CNTERR	7	03490	R 03556 -
1484		B	UPIX	7	03497	J 03598
1485		SW	NOTRDY&1,BUSY&1	11	03504	, 03415 03430
1486		SW	DATA&1,EXTCND&1	11	03515	, 03445 03460
1487		SW	NOTRNS&1,HLR&1	11	03526	, 03475 03490
1488		MRCG	237,SAVIND	12	03537	D 00237 02803 \$
1489		B	ERRCTL	7	03549	J 02841
1490	CNTERR	SBR	X6	7	03556	G 00054 B
1491	OPT2 A		010,0&X1	11	03563	A 09577 000#0
1492	A		070,X6	11	03574	A 09584 00054
1493	CW		ERROSH&1	6	03585	D 03148
1494	B		UPIX&19	7	03591	J 03617
1495	UPIX	SBR	X6	7	03598	G 00054 B
1496	HLCS		0 0,0&X5	12	03605	D 09576 00#0 3
1497	OPT2 A		020,X1	11	03617	A 09590 00029
1498	A		020,X5	11	03628	A 09590 00049
1499	B		0&X6	7	03639	J 00#0
1500						

CHECK FOR WLR
GO UPDATE IND REG
RESET INSTRUCTIONS
SAVE IND
RETURN
STORE RETURN ADDR
UPDATE STATUS COUNT
UPDATE RETURN ADDR
TURN OFF ERROR SW
STORE RETURN ADDR
REMOVE STATUS CHAR
UPDATE IND REG 1
UPDATE IND REG 5
RETURN TO PROGRAM

I/O DICOST SEQUENCE CONTROL

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1502		OPT1***	ALTER ROUTINE SEQUENCE ***			
1503		OPT1	*** I/O DICOST PROGRAM ***			
1504			IF THE ALTER ROUTINE SEQUENCE OPTION HAS BEEN SELECTED, MONITOR			
1505			WILL BRANCH TO THIS ROUTINE. THE LIST OF ROUTINE NUMBERS ENTERED			
1506			BY THE CE IS EXAMINED AND THE ROUTINES ARE MADE TO RUN IN THE			
1507			SEQUENCE SELECTED. WHEN ALL ROUTINES SELECTED HAVE BEEN RUN THE			
1508			PROCESS IS REPEATED OR THE ROUTINE GOES TO PROGRAM CONTROL. THIS			
1509			IS DETERMINED BY THE LAST CHARACTER ENTERED WHEN THIS OPTION WAS			
1510			SELECTED, IF IT IS L THE PROCESS IS REPEATED, IF IT IS E THE PRO-			
1511			CESS ENDS AFTER ONE PASS.			
1512						
1513	SEQCT	OPT1 BCE	PRGCTL, 0EX4, E	12	03646	B 02250 00+00 E
1514		OPT1 BCE	*E8, 0EX4, L	12	03658	B 03677 00+00 L
1515		OPT1 B	*E13	7	03670	J 03689
1516		OPT1 MLNA	SQCON1, X4	12	03677	D 02738 00044 /
1517		OPT1 MLNS	1EX4, CMPFLD-1	12	03689	D 00+01 02741 I
1518		OPT1 MLNS		1	03701	D
1519		OPT1 A	232, X4	11	03702	A 09583 00044
1520		OPT1 MLNA	2099952, X1	12	03713	D 09595 00029 /
1521	LOCWM	OPT1 SCNLA	1CX1, 1EX1	12	03725	D 000+1 000+1 0
1522		OPT1 SAR	X1	7	03737	G 00029 A
1523		OPT1 BCE	*E8, 1EX1, N	12	03744	B 03763 000+1 N
1524		OPT1 B	LOCWM	7	03756	J 03725
1525		OPT1 C	3EX1, CMPFLD-1	11	03763	C 000+3 02741
1526		OPT1 BE	*E8	7	03774	J 03788 S
1527		OPT1 B	LOCWM	7	03781	J 03725
1528		OPT1 BW	*E8, 4EX1	12	03788	V 03807 000+4 1
1529		OPT1 B	LOCWM	7	03800	J 03725
1530		OPT1 ZA	X1, X3	11	03807	H 00029 00039
1531		OPT1 A	212, X3	11	03818	A 09577 00039
1532		OPT1 B	0EX3	7	03829	J 000+0
1533						

*** I/O DICOST PROGRAM ***

SUMMARY ROUTINE

AFTER A COMPLETE PASS OF THE PROGRAM OR IF THE PROGRAM IS TERMINATED THIS ROUTINE ORGANIZES A SUMMARY OF PROGRAM DETECTED ERRORS AND STATUS ERRORS. IT CAUSES THIS SUMMARY TO BE TYPED AND BRANCHES TO THE END OF TEST ROUTINES. THIS ROUTINE IS ALSO USED TO TYPE OUT THE ERROR COUNT 10 MESSAGE WHEN A PROGRAM DETECTED ERROR OCCURES FOR THE TENTH TIME.

LINE	CODE	MSG	PG	DATE	TIME	FROM	TO	INFO
1544	SUMLT	OPT2 B	7	03836	J	01593		
1545	OPT2	DCW	7	03849				
1546	OPT2	MLNWA	12	03851	D	09597	03912	V
1547	OPT2	ZA	11	03863	M	09602	00059	
1548	MOV	CNTOPT1 MLNS	12	03874	D	01YH1	03916	I
1549	OPT2	C	11	03886	C	03916	09577	
1550	OPT1	BH	7	03897	J	03918	U	
1551	OPT2	B	7	03904	J	01593		
1552	CNTMSG	OPT2 DCW	6	03916				
1553	OPT2	A	11	03918	A	09577	03912	
1554	OPT2	A	11	03929	A	09577	00059	
1555	OPT2	C	11	03940	C	03912	09604	
1556	OPT2	BE	7	03951	J	03965	S	
1557	OPT2	B	7	03958	J	03874		
1558	OPT2	ZA	11	03965	M	09609	00059	
1559	MOV	SICOPT2 MLCA	12	03976	D	02YB8	04008	T
1560	OPT2	MLNWA	12	03988	D	02WB2	04011	/
1561	OPT2	B	7	04000	J	01593		
1562	CNTMSG	OPT2 DCW	5	04011				
1563	OPT2	A	11	04013	A	09590	00059	
1564	OPT2	BCE	12	04024	B	08404	04007	H
1565	OPT2	B	7	04036	J	03976		
1566	SUMARY	OPT2 MLNWA	12	04043	D	00029	04072	/
1567	OPT2	CW	6	04055	H	00028		
1568	OPT2	B	7	04061	J	01593		
1569	HAXMSG	OPT2 DCW	12	04079				
1570	SUMXIT	OPT2 B	7	04081	J	03135		

I/O DICOST SUMMARY ROUTINE

PGLEN LABEL OPCODE OPERAND

1571 EQU 201

1572 PST

CYLFED

PGLEN

1571

1572

INITIALIZE FOR DAO3

PCLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1574	START	SW	CHNLSW61	6	04088	TURN ON CHANNEL SW
1575		MLCA	2000002,FILE65	12	04094	RESET FILE ADDR TO 0
1576		MRCWG	INTREI,108	12	04106	LOAD INTERRUPT INST
1577		SW	FILE61	6	04118	RESET DELAY
1578		S	DELAY	6	04124	RESET OVLAP COUNTER
1579		S	OVL CNT	6	04130	RESET TOTAL TIME CNT
1580		S	TOTIME	6	04136	RESET TOTAL TIME CNT
1581		S	SEQFLD-1	6	04142	RESET ERROR COUNTERS
1582		S		1	04148	
1583		S		1	04149	
1584		S		1	04150	
1585		S		1	04151	
1586		S		1	04152	
1587		B	TYPI	7	04153	GO TYPE BLANKS
1588		DCW	2000002,FILE65	17	04176	
1589		MCP	BLANK	10	04178	TYPE BLANKS
1590		BAL	661	7	04188	
1591		BCB1	668	7	04195	CONSOLE STILL BUSY
1592		B	GETSET	7	04202	
1593		A	20172,TOTIME	11	04209	KEEP TOTAL TIME
1594		B	TIMEIT	7	04220	
1595		ZA	2013002,X10	11	04227	LOAD IX10
1596		ZA	2000002,X15	11	04238	LOAD IX 15
1597		ZA	EN18,X3	11	04249	LOAD IX3
1598		B	N18610	7	04260	
1599						

CT ADDR INSTRUCTION

TEST NOT READY
OPCOD OPERAND

LABEL

PGLIN

*** TEST ROUTINE DESCRIPTION ***
 *** TEST NOT READY ***

THIS TESTS THE ABILITY OF THE 7631-1301 TO GIVE A NOT READY INDICATION WHEN AN INOPERATIVE ACCESS IS ADDRESSED. EVERY MODULE AND ACCESS ARE ADDRESSED UNTIL ONE INDICATES NOT READY. IF NONE GIVE A NOT READY IT IS CONSIDERED AN ERROR. NOTE IF MODULES 0-9 ARE AVAILABLE ON ONE CHANNEL, THE ACCESS ON ONE OF THE MODULES MUST BE SET INOPERATIVE BEFORE RUNNING THIS PROGRAM.

ONLY THE SEEK OPERATION IS USED IN THIS ROUTINE

1601	NO1	NOP				1	04267	N
1602		DC	2012	ROUTINE ID		2	04269	
1603	BOTTOM	MLCA	200002, FILE 5	LOAD FILE ADDR		12	04270	D 09626 09696 T
1604	TSTRDY	SD	1, FILE	TRY A MOD		10	04282	M 8FO 09691 R
1605		BAL	*E1			7	04292	R 04299 M
1606		BNRL	NOTRDE	BRCH NOT READY		7	04299	R 04337 I
1607		A	212, FILE 1	ADD 1 TO MOD ADDR		11	04306	A 09577 09692
1608		BZ	*E8	BRCH ON TENTH MOD		7	04317	J 04331 V
1609		B	TSTRDY			7	04324	J 04282
1610		SW	E2	NO ACCESS OR MODULE WAS FOUND		6	04331	, 01803
1611				NOT READY. ERROR 2 IS INDICATED BECAUSE OF THIS. INSURE THAT ONE		12	04337	D 07523 09692 I
1612				ACCESS IS INOPERATIVE OR SOME MODULE 0-9 IS OFF LINE.		7	04349	J 02066
1613		NOTRDE	MLNS	RDYMSG 8, FILE 1				
1614		NOEXIT	B	MONITR				

1628

CT ADDR'S INSTRUCTION

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1630	000 TEST ROUTINE DESCRIPTION 000
1630	

1631
*** TEST ACCESS BUSY ***

11632 TWO SUCCESSIVE SEEK OPERATIONS ARE ISSUED TO THE ACCESS BEING
11633 TESTED, AFTER THE 2ND SEEK THE BUSY INDICATOR IS CHECKED. IF BUSY
11634 IS NOT ON ERROR 4 IS INDICATED. A READ HAD OPERATION FOLLOWING THE
11635 TWO SEEKS VERIFIES THAT THE ACCESS ARRIVED AT THE CORRECT LOCA-
11636 TION. ALL COMMON STATUS ERRORS ARE ALSO CHECKED IN THIS ROUTINE.
11637 THE TRACK-HEAD ADDRESS USED IS 9#20 HAI .

[illegible]

1349 *** SET ERROR 4 ON ***

0541
CS
F4
SET ERROR IND

THEY ARE NOT TURNED ON BY 2 SUCCESSIVE SKS

READ & VERIFY ACC

ACN 8-16
ARRIVAL

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BAL 661

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840
84

IF THE ACCESS DID NOT ARRIVE AT THE CORRECT LOCATION THE NO RECORD FOUND WILL CAUSE THE NO TRANSFER AND EXTERNAL CONDITION STATUS INDICATORS TO COME ON.

7659 802XIT B MONITOR

7 04456 J 02086

1680

TEST DATA CHECK & EXT CONDITION

DA03 PAGE 111

LINE	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1698		MLCA	HAAREA,DATAFD&23	12	04516	D 09347 09723 Y
1699		MLCS	@ 2,DATAFD&30	12	04520	D 09576 09730 3
1700		MU	ZF7,FILE,W	10	04540	M ZF7 09691 W
1701		BCBI	*-16	7	04550	R 04540 2
1702		BAI	*G1	7	04557	R 04564 M
1703		BER1	FURCHK	7	04564	R 04577 4
1704			*** SET ERROR 5 ON ***			
1705		SW	E5	6	04571	. 01806
1706			ILLEGAL FORMAT CHAR DIDN T CAUSE DATA CHECK			
1707	FORCHK	MLCS	@2,DATAFD&30	12	04577	D 09590 09730 3
1708		MLCA	GAP6,DATAFD&63	12	04589	D 09381 09763 Y
1709		MRCWG	GAP6,DATAFD&78	12	04601	D 09381 09778 L
1710		MU	ZF7,FILE,W	10	04613	M ZF7 09691 W
1711		BAI	STACHK	7	04623	R 03298 M
1712		MLCS	@2,DATAFD&24	12	04630	D 09631 09724 3
1713		WDC	1,FILE	10	04642	M ZF3 09691 W
1714		BAI	*G1	7	04652	R 04659 M
1715		BEF1	GAPCK	7	04659	R 04672 8
1716			*** SET ERROR 6 ON ***			
1717		SW	E6	6	04666	. 01807
1718			LONG GAP DIDN T CAUSE EXT. CONDITION			
1719	GAPCK	MLCA	@312,DATAFD&24	12	04672	D 09633 09724 Y
1720		WDC	1,FILE	10	04684	M ZF3 09691 W
1721		BAI	*G1	7	04694	R 04701 M
1722		BEF1	TSTWFO	7	04701	R 04714 8
1723			*** SET ERROR 7 ON ***			
1724		SW	E7	6	04708	. 01800
1725			MISSING GAP DIDN T CAUSE EXT. CONDITION			
1726	TSTWFO	MLCS	@42,DATAFD&23	12	04714	D 09631 09723 3
1727		WDC	1,FILE	10	04726	M ZF3 09691 W
1728		BER1	N03XIT-6	7	04736	R 04757 4
1729		BAI	STACHK	7	04743	R 03298 M
1730		B	N03XIT	7	04750	J 04763
1731			*** SET ERROR 8 ON ***			
1732		SW	E8	6	04757	. 01809
1733			PROPERLY WRITTEN FORMAT.CAUSES DATA CHECK WHEN WRITE CHECKED			

TEST ROUTINE DESCRIPTION	STATUS
TEST ROUTINE DESCRIPTION	STATUS

***TEST DATA CHECK CAUSED BY PARITY,CHAR CODE CHK ***

*** WRITE DISK CHECK ***

A RECORD IS WRITTEN IN 6 BIT MODE USING THE HAO OP, THIS IS FOLLOWED BY A READ HAO OPERATION, 8 BIT MODE, CAUSING PARITY OR CHAR CODE CHECK IN THE 7631. THE DATA CHECK INDICATOR IS TESTED AND IF IT IS NOT ON ERROR 9 IS INDICATED. A WRITE 8 BIT MODE HAO IS ISSUED, AND AGAIN THE DATA CHECK IS TESTED, IF IT ISN T ON, ERROR 10 IS INDICATED. THE RECORD IS REWRITTEN IN THE 6 BIT MODE BUT BEFORE IT IS WRITE CHECKED THE DATA FIELD IN MEMORY IS ALTERED. THE RECORD IS WRITE CHECKED USING THE ALTERED DATA FIELD AND THE DATA CHECK IND IS TESTED IF IT ISN T ON ERROR 11 IS INDICATED.

FORMAT REQUIRED IS IN SIX BIT MODE ON CYLINDER 253

[illegible]

DATA FIELD ORGANIZATION

HAZ 3 CHAR-REC ADDR 6 CHAR-RECORD 10 CHAR

DATA FIELD USED

88ADDROL 444-1-66

[illegible]

*** SET ERROR 9 ON ***

PGLIN	LABEL	TEST DATA CHECK	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1773		SW E9		SET ERROR IND	6	04846	01810
1774		8 BIT MODE READ OF 6 BIT MODE DATA DOESN T CAUSE DATA CHECK					
1775	WRINOD	HRCNG HAOP, DATAFD		LOAD THE	12	04852	D 09383 09700 L
1776		MLCNS 2ND, DATAFDG18		DATA FIELD	12	04864	D 09575 09718 7
1777	LU	XF5, FILE, W		WRITE RECORD IN	10	04876	L XF5 09691 M
1778	BAI	081		WRONG MODE	7	04886	R 04893 M
1779	BEXL	REWRT, Y		BRCH ON NO T, E.C.	7	04893	R 04906 Y
1780		*** SET ERROR 10 ON ***					
1781		SW E10		TURN ON ERROR IND	6	04900	01811
1782		8 BIT MODE WRITE WITH 6 BIT MODE FORMAT DOESN T CAUSE DATA CHECK					
1783	REWRT	MU XF5, FILE, W		REWRITE RECORD	10	04906	M XF5 09691 M
1784	BAI	SYCHK		BRCH ON ANY ERROR	7	04916	R 03298 M
1785	MLCA	2 2, DATAFDG8		ALTER RECORD WRITN	12	04923	D 09576 09700 Y
1786	WDC	1, FILE		WRITE CHK	10	04935	M XF3 09691 M
1787	BAI	081			7	04945	R 04952 M
1788	BERI	N04XIT		BRCH ON DATA CHK	7	04952	R 04965 4
1789		*** SET ERROR 11 ON ***					
1790		SW E11		SET ERROR IND	6	04959	01812
1791		WRITE CHECK WITH ALTERED DATA FIELD DOESN T CAUSE DATA CHECK					
1792	N04XIT	0		MONITR	7	04965	J 02066
1793							

CT ADDR INSTRUCTION

PGLIN LABEL

OPCOD OPERAND

1795 *** TEST ROUTINE DESCRIPTION ***
1796 ***TEST EXT CONDITION AND NO TRANSFER CAUSED BY ***
1797 *** INVALID ADDRESS,NO RECORD FOUND & IMPROPER MODE SETTING
1798 A SEEK OP WITH INVALID ADDR 9280 IS ISSUED,THIS IS FOLLOWED
1799 BY A READ HAD OP.SINCE THE INVALID ADDR SHOULD HAVE CAUSED THE
1800 ACCESS TO REZERO,THE DATA CHECK IND SHOULD BE TURNED ON.IF THE
1801 INDICATOR IS NOT ON ERROR 12 IS INDICATED.THE ACCESS IS RE-POS-
1802 ITIONED TO CYL 253 9#20 AND A READ OP WITH ADDR 9#00 IS ISSUED.
1803 THE NO RECORD FOUND SHOULD TURN ON EXT COND AND NO TRANSFER.IF
1804 EITHER OR BOTH THE INDICATORS DO NOT COME ON ERRORS 13&14 RESP-
1805 ECTFULLY ARE INDICATED.ANOTHER SEEK IS ISSUED FOLLOWED BY A WRITE
1806 DISK CHECK,THIS SHOULD CAUSE IMPROPER MODE SETTING RESULTING IN
1807 AN EXT CONDITION.IF IT DOESN T ERROR 15 IS INDICATED.

NOS	NO5	NOP	ROUTINE ID	CT	ADDR	INSTRUCTION
1808				1	04972	N
1809		DC	2052	2	04974	
1810		MLCA	292802,FILE25	12	04975	D 09637 09696 T
1811		SD	1,FILE	10	04987	M 2FO 09691 R
1812		BCB1	--16	7	04997	R 04987 2 G
1813		BA1	*21	7	05004	R 05011 H
1814		MLCA	200002,FILE25	12	05011	D 09626 09696 T
1815		MU	2F5,FILE,R	10	05023	M 2F5 09691 R
1816		BCB1	--16	7	05033	R 05023 2 G
1817		BA1	*21	7	05040	R 05047 H
1818		BER1	RESEEK	7	05047	R 05060 4
1819			BRCH ON DATA CHK			
1820			*** SET ERROR 12 ON 222			
1821		SW	E12	6	05054	* 01813
1822			INVALID ADDRESS DOESN T RESULT IN DATA CHECK			
1823		RESEEK	SD 1,FILE	10	05060	M 2FO 09691 R
1824		BCB1	--16	7	05070	R 05060 2 G
1825		BA1	*21	7	05077	R 05084 H
1826		MLCA	29#202,FILE25	12	05084	D 09630 09696 T
1827		SD	1,FILE	10	05096	M 2FO 09691 R
1828		BCB1	--16	7	05106	R 05096 2 G
1829		BA1	*21	7	05113	R 05120 H
1830		MLCA	29#002,FILE25	12	05120	D 09641 09696 T

PGLIN	LABEL	TEST. EXTERNAL COND & NO TRANS	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1831			MU	2F5, FILE, R	10	05132	M 2F5 09691 R
1832			BCB1	--16	7	05142	R 05132 2
1833			BAL	001	7	05149	R 05156 H
1834			BEF1	007	7	05156	R 05169 8
1835				*** SET ERROR 13 ON ***			
1836			SW	E13	6	05163	, 01814
1837				NO RECORD FOUND NOT SETTING EXT CONDITION			
1838			BNT1	007	7	05169	R 05182 B
1839				*** SET ERROR 14 ON ***			
1840			SW	E14	6	05176	, 01815
1841				NO RECORD FOUND NOT SETTING NO TRANSFER			
1842			SD	1, FILE	10	05182	M 2F0 09691 R
1843			BAL	001	7	05192	R 05199 H
1844			WDC	1, FILE	10	05199	M 2F3 09691 W
1845			BCB1	--16	7	05209	R 05199 2
1846			BAL	001	7	05216	R 05223 H
1847			BEF1	NOEXIT	7	05223	R 05236 8
1848				*** SET ERROR 15 ON ***			
1849			SW	E15	6	05230	, 01816
1850				IMPROPER MODE SETTING DOESN'T CAUSE EXT CONDITION			
1851			NOEXIT	B	7	05236	J 02066
1852							

PCOLIN LABEL INSTRUCTION

1890 *** TEST ROUTINE DESCRIPTION ***
1891 *** RANDOM SEEK TEST ***
1892 USING A FOUR DIGIT NUMBER DEVELOPED FROM THE TIME TAKEN FOR THE
1893 CARRIAGE ON THE TYPEWRITER TO RETURN, RANDOM ADDRESSES ARE GENER-
1894 ATED FOR THE FILE. A SEEK IS ISSUED FOR EACH ADDRESS AND ARRIVAL
1895 OF THE ACCESS IS VERIFIED BY A READ HAO OP. IF THE READ OP RESULTS
1896 IN A NO RECORD FOUND, ERROR 1 IS INDICATED FOLLOWED BY THE FILE
1897 ADDRESS BEING USED. ANY STATUS INDICATORS ENCOUNTERED BY THE SEEK
1898 OR READ OPS WILL ALSO BE INDICATED. IF THE PROGRAM IS IN THE MAN-
1899 UAL MODE, A NO RECORD FOUND ON THE READ OP WILL CAUSE A REQUEST T
1900 TURN ON THE CE-HAO SO THAT THE ADDRESS AT WHICH THE ACCESS
1901 ACTUALLY ARRIVED AT CAN BE DISPLAYED FOR ANALYSIS. 100 SEEKS ARE
1902 MADE IN THE ROUTINE, AFTER WHICH THE ACCESS IS POSITIONED AT THE
1903 DIAGNOSTIC CYL. 253.

1904	N07	NOP				1	05340	N
1905		DC	2072	ROUTINE ID		2	05342	
1906		SW	FILE&2			6	05343	, 09693
1907		MLNWA	TOTIME, FILE&5	MOVE IN RANDOM ADDR		12	05349	D 09323 09696 V
1908	SEEKS	SD	1, FILE	MOVE THE ACCESS		10	05361	M 2F0 09691 R
1909		BCD1	*-16			7	05371	R 05361 Z
1910		BA1	STACHK			7	05378	R 03298 M
1911		HU	2F5, FILE, R	VERIFY ACCESS ARRIVL		10	05385	M 2F5 09691 R
1912		BCD1	*-16			7	05395	R 05385 2
1913		BEX1	VERROR, Y	BRCH ON COND ON NOT		7	05402	R 05463 Y
1914		BA1	*&1			7	05409	R 05416 M
1915		A	2000, TOTIME	INCREASE VARIABLE BY		11	05416	A 09644 09323
1916	RANDOM	A	TOTIME, FILE&5	300 AND ADD TO ADR		11	05427	A 09323 09696
1917		A	212, COUNT	ADD 1 TO PASS COUNT		11	05438	A 09577 09528
1918		BZ	ENDSKS	BRCH ON 101 PASS		7	05449	J 05614 V
1919		B	SEEKS			7	05456	J 05361
1920								
1921				*** SET ERROR 1 ON ***				
1922	VERROR	SW	BL, EXTRA&1	SET ERROR		11	05463	, 01802 03217
1923				ON A RANDOM SEEK ACCESS POSITION RESULTED IN A NO RECORD FOUND				
1924		MRCWG	FILE, DATA	MOVE FAILING ADDR		12	05474	D 09691 01710 L
1925		RA1	STACHK	GO TO STATUS CHECK		7	05486	R 03298 M

TEST WRITE FORMAT 6 BIT MODE

PCOLIN LABEL OP CODE OPERAND CT ADDR INSTRUCTION

1946 *** TEST ROUTINE DESCRIPTION ***
1947 *** TEST WRITE 6 BIT MODE FORMAT ***
1948 THIS ROUTINE WRITES A SHORT FORMAT FOR CYL. 253 IN THE 6 BIT
1949 MODE. THE FORMAT IS WRITE CHECKED AND IF A DATA CHECK RESULTS,
1950 ERR 18 IS INDICATED. IN ADDITION ANY STATUS INDICATORS ENCOUNTERED
1951 BY THE WRITE FORMAT, OR THE WRITE CHECK, WILL BE DISPLAYED IN
1952 THE ERROR TYPEOUT.
1953
1954 FORMAT WRITTEN ON CYL 253 IN 6 BIT MODE
1955 44433333333333333333411111222222222211111111111111111111111121
1956 11111111111122222222221111111111111111111111111111111111112222
1957 2222222211
1958 112

1959
1960 ORGANIZATION OF FORMAT
1961 GAP1--HA1--GAP2--HA2 9CHARS--X GAP--REC ADDR 10CHAR--Y GAP--REC
1962 AREA 14CHARS--X GAP--REC ADDR 10CHARS--Y GAP--REC AREA 14CHARS--
1963 REC ADDR 10CHARS--X GAP--REC AREA 64CHARS--GAP3

1964	NOP									1	05657	N
1965	DC	2082								2	05659	
1966	CS	DATAFD0225								6	05660	/ 09925
1967	CS									1	05666	/
1968	CS									1	05667	/
1969	MLCS	212, DATAFD								12	05668	D 09577 09700 3
1970	MLCA	292202, FILE65								12	05680	D 09630 09695 T
1971	SW	DATAFD0225								6	05692	, 09925
1972	MRN	DATAFD, DATAFD01								12	05698	D 09700 09701 9
1973	MLNA	HAAREA, DATAFD023								12	05710	D 09347 09723 /
1974	MLNA	GAP6, DATAFD063								12	05722	D 09381 09763 /
1975	MLNA	GAP6, DATAFD0111								12	05734	D 09381 09811 /
1976	MLNA	GAP6, DATAFD0159								12	05746	D 09381 09859 /
1977	MRCWG	GAP6, DATAFD0224								12	05758	D 09381 09924 L
1978	MU	2F7, FILE, W								10	05770	M 2F7 09691 W
1979	BCB1	--16								7	05780	R 05770 2
1980	BAL	STACHK								7	05787	R 03298 M
1981	WDC	1, FILE								10	05794	M 2F3 09691 W

WRITE THE FORMAT
BRCH ON ANY ERROR
WRT DISK CHK

TEST WRITE FORMAT 6 BIT MODE

CT ADDR INSTRUCTION

7 05804 R 05811 H
7 05811 R 05825 4
7 05818 J 05831

OPCD OPERAND

BA1 *C1
BER1 *C8
B NO8XIT

BRCH ON DATA CHK

*** SET ERROR 10 ON ***

SET ERROR IND

6 05825 , 01819

WRITE CHECK OF THE FORMAT RESULTS IN A DATA CHECK

NO8XIT B MONIIR

7 05831 J 02066

1982
1983
1984
1985
1986
1987
1988
1989

一、
 二、
 三、
 四、
 五、
 六、

TEST ROUTINE DESCRIPTION	DATE
1. Initial Test	10/10/2023
2. Intermediate Test	11/10/2023
3. Final Test	12/10/2023
4. Post-Test	13/10/2023
5. Summary	14/10/2023

000 TEST READ&WRITE IN 6 BIT MODE 000

A TRACK OF 100 CHARACTERS IS WRITTEN.THE TRACK IS WDC,READ INTO MEMORY AND COMPARED TO THE ORIGINAL DATA THAT WAS WRITTEN.IF THE WRITE CHECK TURNS ON DATA CHECK ERROR 19 IS INDICATED,IF THE READ DATA DOES NOT COMPARE WITH THE WRITE DATA,ERROR 20 IS INDICATED. ANY STATUS INDICATORS ENCOUNTERED WILL BE DISPLAYED.THE TEST IS REPEATED 40 TIMES,ONCE FOR EACH HEAD ON THE ACCESS. USES CYL 253

FORMAT REQUIRED SAME AS THE FORMAT DESCRIBED IN ROUTINE R000

DATA FIELD ORGANIZATION

NAME 2CHARS--REC ADDR 6CHARS--RECORD 10CHARS--REC ADDR 6CHARS--

RECORD 100CHARS--REC ADDR 6CHARS--RECORD 60CHARS

DATA FIELD USED

	\$9	-7.8	#33	EABC
ADDR03.	ADDR021268621			
----	----			
000001++-	---			

DEFGHI-JKLMNOPQR*STUVWXYZ035679

209

NO.

ROUTINE ID

ROUTINE ID
SET TKHD ADDR

2092

M. CA 294202. FILE 5

0334 B

CHILD'S

4317

UPDATE TKHD ADDR

531114

ARCH IF CYL COMPLETE

ACE NO9XIT.FIL.E64.6

CLEAR

DATAFD3225

DATA

DEPT

LOAD THE DATA FIELD

ARCING HAOP. DATAED

WRITE THE RECORDS

11-2113-538 194

ARCH ON ANY ERROR

1105 43 OH

BRING ON ANY THREAT
WRITE CHECK THE DATA

BAI
SIACHA

WALIE CHECK THE

WDC I, FBI

BRCH ON DATA LAK

BERL 4615

BRCH ON ANY ERROR

BAI STACHK

B **RDC HK 6**

*** SET ERROR 19 ON ***

1	05838	N			
2	05840				
12	05841	D	09630	09696	Y
7	05853	J	05889		
6	05860	:	09695		
11	05866	A	09577	09696	
12	05877	B	06036	09695	6
6	05889	/	09925		
1	05095	/			
1	05896	/			
12	05897	D	09383	09700	L D
10	05909	M	ZF5	09691	W
7	05919	R	03298	G H	
10	05926	M	ZF3	09691	W
7	05936	R	05957	4	
7	05943	R	03298	G H	
7	05950	J	05963		

DAO3 INSTRUCTION

CT ADDR

TEST READ & WRITE IN 6 BIT MODE

OPCODE OPERAND

PGLIN LABEL

2027	SW	E19	SET ERROR IND	6	05957	01820
2028	WRITE CHECK OF RECORD RESULTS IN DATA CHECK					
2029	NRCC	DATAFD,DATAFD&101	SAVE DATA WRITTEN	12	05963	D 09700 09001 0
2030	CS	DATAFD&99	CLEAR DATA FIELD	6	05975	/ 09799
2031	HU	XF5,FILE,R	READ DATA BACK	10	05981	H XF5 09691 R
2032	BAL	STACK	BRCH ON ANY ERROR	7	05991	R 03290 H
2033	C	DATAFD&200,DATAFD&99	CHECK DATA READ	11	05998	C 09900 09799
2034	DE	CHKHDS	IF IT IS GOOD BRCH	7	06009	J 05000 S
2035	*** SET ERROR 20 ON ***					
2036	SW	E20	SET ERROR IND	6	06016	01021
2037	READ DATA DOES NOT COMPARE WITH ORIGINAL WRITE DATA					
2038	B	NONITR	GO REPORT ERROR	7	06022	J 02033
2039	D	CHKHDS	RETURN HERE	7	06029	J 05000
2040	D	NONITR		7	06036	J 02033
2041						

DAO3
CT ADDR INSTRUCTION

TEST WRITE FORMAT 8 BIT MODE

OPCODE OPERAND

PGLIN LABEL

*** SET ERROR 21 ON ***

2079

SU

E21

SET ERROR IND

2080

2081

WRITE CHECK OF THE FORMAT RESULTS IN A DATA CHECK

NIOXLT

B

MONITR

2082

2083

6 06204 , 01822

7 06210 J 02066

DA03 INSTRUCTION
CT ADDR

TEST READ & WRITE IN 8 BIT MODE

OPCOD OPERAND

PGLIN LABEL

2085 *** TEST ROUTINE DESCRIPTION ***
2086 *** TEST READ&WRITE IN 8 BIT MODE ***
2087 A RECORD OF 100 CHARACTERS,HA2 & 3 RECORDS & 3 RECORD ADDRESSES
2088 ,IS WRITTEN USING HAD IN 8 BIT MODE.IT IS WRITE CHECKED,READ BACK
2089 INTO MEMORY,AND COMPARED AGAINST THE ORIGINAL DATA WRITTEN,IF
2090 THE WRITE CHECK RESULTS IN DATA CHECK,ERROR 22 IS INDICATED,IF
2091 THE READ DATA DOES NOT COMPARE TO THE WRITE DATA ERROR 24 IS
2092 INDICATED.SINCE THE RECORD IS WRITTEN AND READ IN 8 BIT MODE THE
2093 READ DATA IS CHECKED FOR A WORD MARK IN A FIXED LOCATION. IF THE
2094 WORD MARK IS NOT THERE ERROR 23 WILL BE INDICATED.ANY STATUS
2095 ERROR WILL ALSO BE INDICATED.THE TEST IS REPEATED 40 TIMES,ONCE
2096 FOR EACH HEAD ON THE ACCESS. USES CYL 253

FORMAT REQUIRED SAME AS THE FORMAT DESCRIBE IN ROUTINE N10

DATA FIELD ORGANIZATION
HA2 2CHARS---REC ADDR 6CHARS---RECORD 10CHARS---REC ADDR 6CHARS---
RECORD 10CHARS---REC ADDR 6CHARS---RECORD 60CHARS
DATA FIELD USED
80ADDR010---888 ADDR0212488421 ADDR03.0 \$* -/,% #B2 EABC
DEFCH1-JKLHNDPQRSTUVWXYZ035679

2106	N11	NOP		ROUTINE ID		1	06217	N
2107	DC	0110		SET TKHD ADDR		2	06219	
2108	MLCA	09#200,FILE\$5		CLEAR		12	06220	D 09630 09696 T
2109	CS	DATAFD\$225				6	06232	/ 09925
2110	CS			DATA		1	06238	/
2111	CS			FIELD		1	06239	/
2112	MRCWG	HAOP,DATAFD		LOAD THE DATA FIELD		12	06240	D 09383 09700 L
2113	LU	\$F5,FILE,W		WRITE THE DATA		10	06252	L \$F5 09691 W
2114	BAI	STACHK		BRCH ON ANY ERROR		7	06262	R 03298 H
2115	LU	\$F3,FILE,W		WRITE CHECK THE DATA		10	06269	L \$F3 09691 W
2116	BERI	\$E15		BRCH ON DATA CHECK		7	06279	R 06300 4
2117	BAI	STACHK				7	06286	R 03298 H
2118	B	ROCHK8				7	06293	J 06306

*** SET ERROR 22 ON ***

139

TEST READ & WRITE IN 8 BIT MODE

DA03

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PCLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
2121		SW	E22	6	06300	SET ERROR IND
2122			WRITE CHECK OF RECORD RESULTS IN A DATA CHECK			
2123	RDCHK8	HRCG	DATAFD,DATAFD&101	12	06306	D 09700 09801 \$
2124		CS	DATAFD&99	6	06318	/ 09799
2125		LU	XF5,FILE,R	10	06324	L XF5 09691 R
2126		BA1	STACK	7	06334	R 03298 M
2127	CHKWN	BW	&67,DATAFD&2	12	06341	V 06359 09702 1
2128			*** SET ERROR 23 ON ***			
2129		SW	E23	6	06353	SET ERROR IND
2130			WORD MARK MISSING FROM READ DATA			
2131	DATCK8	C	DATAFD&200,DATAFD&99	11	06359	C 09900 09799
2132		BE	&67	7	06370	J 06383 S
2133			IF IT IS GOOD BRCH			
2134			*** SET ERROR 24 ON ***			
2135		SW	E24	6	06377	SET ERROR IND
2136			READ DATA DOES NOT COMPARE TO WRITE DATA			
2137	HI1XIT	B	MONIIR	7	06383	J 02066
2138			ALTER ADDRESS BY 1 UNTIL EVERY HEAD			
2139			IS SELECTED AND TESTED IN 8 BIT MODE			
2140	NI2	NOP		1	06390	N
2141		DC	2120	2	06392	
2142		SW	FILE&4	6	06393	09695
2143		A	010,FILE&5	11	06399	A 09577 09696
2144		BCE	NI2XIT,FILE&4,6	12	06410	B 06440 09695 6
2145		ZA	2N11,X3	11	06422	M 09649 00039
2146		B	N11&15	7	06433	J 06232
2147	NI2XIT	B	MONIIR	7	06440	J 02066

TEST FULL TRACK WITH ADDRESSES

OPCODE OPERAND

PCOUNT

2149 *** TEST ROUTINE DESCRIPTION ***
2150 *** TEST FULL TRACK WITH ADDRESSES OPERATION ***
2151 A DATA FIELD OF 3 RECORDS AND ADDRESSES IS WRITTEN IN THE 8 BIT
2152 MODE USING THE WFT OP ON CYL 253 ADDR 9#20 .THE DATA IS READ
2153 BACK IN 8 BIT MODE USING THE RFT OP AND THE DATA READ IS COMPARED
2154 IN MEMORY WITH THE DATA WRITTEN. IF THE DATA DOESN'T COMPARE ERROR
2155 25 IS INDICATED. STATUS ERRORS ARE ALSO INDICATED.
2156

2157 FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10

2158
2159 DATA FIELD ORGANIZATION
2160 REC ADDR 6CHARS---RECORD 10CHARS---REC ADDR 6CHARS---RECORD 10CHARS---
2161 +REC ADDR 6CHARS---RECORD 60CHARS

2162
2163 DATA FIELD USED
2164 ADDR 01#---088 ADDR 0212480421 ADDR 03. # - / , % #02 8ABCDE
2165 6GWI--JKLHNPQR--STUVWXYZ035679

2167	N13	NOP				1	06447	N
2168		DC	0132	ROUTINE ID		2	06449	
2169		CS	DATAFD&225	CLEAR		6	06450	/ 09925
2170		CS		DATA		1	06456	/
2171		CS		FIELD		1	06457	/
2172		HRCG	ADDR1-5, DATAFD	LOAD DATA FIELD		12	06458	D 09385 09700 \$
2173		SW	DATAFD&90	SET WH OVER GM		6	06470	, 09798
2174		HLCA	09#200, FILE&5	SET TRKD ADDR		12	06476	D 09630 09696 T
2175		LU	8F6, FILE, N	WRITE TRK WITH ADDR		10	06480	L 8F6 09691 W
2176		BAL	STACKK	BRCH ON ANY ERROR		7	06498	R 03298 H
2177		HRCG	DATAFD, DATAFD&99	SAVE DATA		12	06505	D 09700 09799 \$
2178		CS	DATAFD&97			6	06517	/ 09797
2179		LU	8F6, FILE, R	READ TRK WITH ADDR		10	06523	L 8F6 09691 R
2180		BAL	STACKK	BRCH ON ANY ERROR		7	06533	R 03298 H
2181		C	DATAFD&97, DATAFD&196	CHECK DATA READ		11	06540	C 09797 09896
2182		BE	067	IF IT IS GOOD BRCH		7	06551	J 06564 S
2183			*** SET ERROR 25 ON ***					
2184		SW	E25	SET ERROR IND		6	06558	, 01826

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CT ADDR5 INSTRUCTION

TEST FULL TRACK WITH ADDRESSES

OPCOD OPERAND

PCLIN LABEL

2105 READ DATA DOES NOT COMPARE WITH DATA WRITTEN

2106 N10XLT B MONIYR

2107

7 06564 J 02066

1967

ENCLOSURE

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2109 *** TEST ROUTINE DESCRIPTION ***
2100 *** TEST FULL TRACK WITHOUT ADDRESSES OPERATION ***
2101
2102 A DATA FIELD OF 3 RECORDS IS WRITTEN IN 0 BIT MODE USING THE ROT
2103 NOT OP ON CYL 253 ADDR 9020 .THE DATA IS READ BACK USING THE ROT
2104 DD AND THE DATA READ IS COMPARED AGAINST THAT WHICH WAS WRITTEN.
2105 IF THE DATA DOES NOT COMPARE ERROR 26 IS INDICATED.ALL STATUS
2106 ERRORS ENCOUNTERED ARE ALSO INDICATED.
2107

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[illegible]

READ DATA DOES NOT COMPARE WITH DATA WRITTEN

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CT ADDR INSTRUCTION

7 06706 J 02066

TEST FULL TRACK WITHOUT ADDRESSES

OPCODE OPERAND

LABEL

PCIN

MONITOR

D

HEXIT

EQ25

TEST SINGLE RECORD OP
CY ADDR INSTRUCTION

TEST SINGLE RECORD OP
OPCD OPERAND

LABEL

PCBIN

2227 *** TEST ROUTINE DESCRIPTION ***
2228 *** TEST SINGLE RECORD OPERATION ***
2229 IN THE EIGHT BIT MODE A SINGLE RECORD OF 10 CHARACTERS IS WRIT-
2230 TEN, ADDRESS-ADDR01. IF NO RECORD FOUND RESULTS, ERROR 27 IS
2231 INDICATED. A READ SINGLE RECORD RECORD ADDRESS ADDR03 IS ISSUED
2232 AND IF A NO RECORD FOUND RESULTS ERROR 28 IS INDICATED. THE DATA
2233 READ BACK IS CHECKED TO INSURE THE PROPER RECORD WAS READ. IF IT
2234 IS NOT THE CORRECT DATA, ERROR 29 IS INDICATED. ALL STATUS ERRORS
2235 WILL BE INDICATED.

2236
2237 FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10

2238 RECORD ADDRESS & DATA FIELD USED IN WRITE SINGLE RECORD. THE REC-
2239 ORD ADDRESS WAS WRITTEN IN ROUTINE 13
2240
2241 ADDR01 3332333234

2242 RECORD ADDRESS USED AND RECORD EXPECTED IN READ SINGLE RECORD
2243 --ADDR03 00 00 -/08 000 8ABCEFGHI-JKLMNOPQR+STUVWXYZ035679

2244	N15	NOP	2150	ROUTINE ID	1	06713	N
2245		DC		CLEAR	2	06715	
2246		CS	DATA00&225		6	06716	/ 09925
2247		CS			1	06722	/
2248		CS			1	06723	/
2249		CS			12	06724	D 09390 09698 T
2250	MLCA	ADDR1, FILE07		SET RECORD ADDR	12	06736	D 09508 09700 L
2251	HRCMG	GAP0-9, DATAFD		LOAD DATA FIELD	10	06748	L 2FI 09691 M
2252	LU	BF1, FILE0N		WRITE SINGLE RECORD	7	06758	R 06779 B
2253	BNT1	0615		BRCH NO TRAN	7	06765	R 03298 M
2254	BAI	STACHK		BRCH ON ANY ERROR	7	06772	J 06705
2255	B	SRORD			6	06779	0 01028
2256				*** SET ERROR 27 ON ***	6	06785	/ 09799
2257	SH	E27		SET ERROR IND	12	06791	D 09422 09698 T
2258				WRITE SINGLE RECORD RESULTS IN NO RECORD FOUND			
2259	SRORD	CS	DATAFD&99	CLEAR DATA FIELD			
2260	MLCA	ADDR3&5, FILE&7		SET RECORD ADDR			
2261							
2262							

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PC L IN	LABEL	TEST SINGLE RECORD OP	OPCODE	OPERAND	CT	ADDRES	INSTRUCTION
2263		MLCWS	200	DATAFD660	12	06803	D 09575 09760 T
2264		LU	3F1	FILE R	10	06815	L 3F1 09691 R
2265		BNTI	0015		7	06825	R 06846 B
2266		BAI	STACK		7	06832	R 03290 M
2267		B	SROCHK		7	06839	J 06852
2268		*** SET ERROR 28 ON ***					
2269		SW	E28		6	06846	01829
2270		READ SINGLE RECORD RESULTS IN NO RECORD FOUND					
2271		SW	DATAFD		6	06852	09700
2272		C	ADDR3665	DATAFD659 CHECK DATA READ	11	06858	C 09482 09759
2273		DE	N15XIT-12	IF IT IS GOOD BRCH	7	06869	J 06882 S
2274		*** SET ERROR 29 ON ***					
2275		SW	E29		6	06876	01830
2276		RECORD READ HAS NOT RECORD EXPECTED					
2277		MLCA	CETKWD	FILEE7	12	06882	D 09534 09698 T
2278		N15XIT	B	MONITR	7	06894	J 02006
2279							

TEST CYLINDER OPERATION

CT ADDR INSTRUCTION

PGLIN LABEL

OPCODE OPERAND

2201 *** TEST ROUTINE DESCRIPTION ***
2202 *** TEST CYLINDER OPERATION ***
2203 WITH A DATA FIELD OF 9 RECORDS 240 CHARS 3 TRACKS ARE WRITTEN
2204 USING THE CYLINDER OPTION. THIS IS DONE ON EVERY 3 TRACKS UNTIL
2205 THE ENTIRE CYLINDER IS COMPLETED. CYL 253 THE ADDRESS IS RESET
2206 AND A READ CYLINDER OF 3 TRACKS IS PERFORMED. THE READ DATA IS
2207 COMPARED TO THE ORIGINAL WRITE DATA AND IF THEY DO NOT COMPARE
2208 ERROR 30 IS INDICATED. THE READ IS REPEATED FOR EVERY 3 TRACKS
2209 ALSO. THIS TEST IS RUN ONLY IF CYO IS AVAILABLE.

2210 FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10.

2211 DATA FIELD ORGANIZATION
2212 RECORD 10CHARS--RECORDS 10CHARS--RECORD 60CHARS REPEAT 2 TIMES

2213 DATA FIELD USED TO WRITE 3 TRACKS
2214 YYY-3 RECORDS OF 80 Y EACH-VVVY

2215	NOP	ROUTINE ID	1	06901	N
2216	DC	0160	2	06903	
2217	DCE	000, SPTAD0, 1	12	06904	B 06923 01004 1
2218	B	N16XIT	7	06916	J 07204
2219	D	TYP2	7	06923	J 01607
2220	DCW	2CYO AVAIL0, G	9	06930	
2221	DC	0 0, G	1	06940	
2222	DCE	000, 0-13, 1	12	06942	B 06961 06940 1
2223	D	N16XIT	7	06954	J 07204
2224	CS	DATAFD0240	6	06961	/ 09940
2225	CS		1	06967	/
2226	CS		1	06968	/
2227	NLCA	CETKHD, FILE07	12	06969	D 09534 09698 1
2228	NLCS	0Y0, DATAFD	12	06981	D 09650 09700 3
2229	SW	DATAFD0239, FILE04	11	06993	, 09939 09695
2230	HRC	DATAFD, DATAFD01	12	07004	D 09700 09701 #
2231	CW	DATAFD0239	6	07016	# 09939
2232	MLCHS	000, DATAFD0240	12	07022	D 09575 09940 7

TEST CYLINDER OPERATION

PCLN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2317	CYOWRT	LU	CFQ, FILE, W	10	07034	L XFA 09691 H
2318		BAI	STACHK	7	07044	R 03298 M
2319		A	232, FILE 25	11	07051	A 09583 09696
2320		O	FILE 25, 2592	11	07062	C 09696 09652
2321		BE	068	7	07073	J 07087 S
2322		B	CYOWRT	7	07080	J 07034
2323		HLCA	29#202, FILE 25	12	07087	D 09630 09696 Y
2324	CYORD	CS	DATAFD 239	6	07099	/ 09939
2325		CS		1	07105	/
2326		CS		1	07106	/
2327		LU	BFQ, FILE, R	10	07107	L XFA 09691 R
2328		BEXI	STACHK, H	7	07117	R 03298 M
2329		BAI	061	7	07124	R 07131 M
2330		SW	DATAFD	6	07131	, 09700
2331		C	DATAFD 239, DATAFD 238	11	07137	C 09939 09938
2332		BE	0614	7	07148	J 07160 S
2333			*** SET ERROR 30 ON ***			
2334		SW	E30	6	07155	, 01631
2335			READ DATA DOES NOT COMPARE WITH DATA WRITTEN			
2336		B	N16XIT	7	07161	J 07204
2337		A	232, FILE 25	11	07168	A 09583 09696
2338		C	FILE 25, 2592	11	07179	C 09696 09652
2339		DE	068	7	07190	J 07204 S
2340		B	CYORD	7	07197	J 07099
2341	N16XIT	B	MONITR	7	07204	J 02066

CT ADDR INSTRUCTION

PCLEN LABEL OPCODE OPERAND

2343 *** TEST ROUTINE DESCRIPTION ***
 2344 *** TEST INTERRUPT FROM 7631-1301 ***
 2345 THIS TEST IS RUN WHEN THE PRIORITY FEATURE IS AVAILABLE. A SEEK
 2346 CYL 000 IS ISSUED. THE PROGRAM ENTERS THE ALERT MODE AND WAITS IN
 2347 A LOOP FOR THE INTERRUPT. AFTER CERTAIN TIME, AN INTERRUPT OCCURS
 2348 ERROR 31 IS INDICATED. STATUS ERRORS ARE ALSO INDICATED.
 2349

2350	N17	NOP			1	07211	N
2351		DC	0170	ROUTINE ID	2	07213	
2352		BCE	008,1264,1	BRCH IF PRIORITY AVL	12	07214	B 07233 01264 1
2353		B	N17XIT		7	07226	J 07313
2354		SD	1, FILE	MOVE THE ACCESS	10	07233	H 0F0 09691 R
2355		BCDL	0-16		7	07243	R 07233 2
2356		BAL	STACK	BRCH ON ANY ERROR	7	07250	R 03298 H
2357		BEPA	061	ENTER ALERT MODE	7	07257	Y 07264 E
2358		S	X7	RESET IX 7	6	07264	S 00099
2359		A	010,X7	WAIT FOR DELAY	11	07270	A 09577 00059
2360		BCE	N17XIT,X7-3,4	BRCH IF DELAY COMPLETE	12	07281	B 07313 00056 4
2361		B	INITUP		7	07293	J 07270
2362		DXPA	061	EXIT ALERT MODE	7	07300	Y 07307 X
2363			*** SET ERROR 31 ON ***				
2364		SW	031	SET ERROR 100	6	07307	0 01032
2365			NO INTERRUPT AT THE COMPLETION OF THE SEEK OP				
2366		N17XIT	B	MONITOR	7	07313	J 02066

CT ADDR INSTRUCTION

UPDATE ROUTINE
OPCOD OPERAND

PGLIN LABEL

*** CHANNEL AND MODULE ADDRESS UPDATE ROUTINE ***

THIS ROUTINE LOCATES CHANNELS WITH 7631 ON THEM AND CAUSES
THE PROGRAM TO BE INITIALIZED ACCORDINGLY AND LOCATES READY
MODULES ON THE CHANNEL. AS LONG AS THERE ARE UNTESTED READY MODULE
AVAILABLE THIS ROUTINE WILL LOOP BACK TO ROUTINE N01 OR N07. WHEN
THERE NO FURTHER UNTESTED MODULES ON ANY CHANNEL THIS ROUTINE
FALLS THROUGH TO MONITOR. THE UPDATE ROUTINE STARTS WITH CHANNEL 1
MODULE 0 AND PROGRESSES THROUGH CHANNEL 4 MODULE 9.

2368	N10	NOP		ROUTINE TO		1	07320	N	
2369		DC	2182			2	07322		
2370		B	TOP27			7	07323	J	07418
2371		BCE	00,00X10,F	FILES ON THIS CHNL		12	07330	B	07349 00:20 F
2372		B	UPCHNL	GO UP DATE FOR NEXT		7	07342	J	07443
2373		MLCA	CODE30X15, INCDE	MOVE CHANNEL CODES		12	07349	D	09EC7 07380 T
2374		B	CHALTR	GO TO CHANNEL ALTER		7	07361	J	01045
2375		DCW	TOP	HIGH LIMIT		5	07372		07411
2376		DC	BOTTOM	LOW LIMIT		5	07377		04270
2377		DCW	2 2			1	07378		
2378		DC	2 2			1	07379		
2379		DC	2 2			1	07380		
2380	INCODE	SH	CHNLSE1	TURN ON CHANNEL SW		6	07381		07530
2381	RDYFIL	SD	1, FILE	SEEK THE ACCESS		10	07387	M	2FO 09691 R
2382		BNRI	0015	BRCH NOT READY		7	07397	R	07418 1 G
2383		BAL	001			7	07404	R	07411 H
2384	Y00	B	GOIT	BRCH, FOUND A RDY MOD		7	07411	J	07484
2385		A	012, FILE1	UPDATE MOD ADDR		11	07418	A	09577 09692
2386		BZ	000	BRCH IF TEN MOD TRID		7	07429	J	07443 V
2387		B	RDYFIL	GO TRY ANOTHER MOD		7	07436	J	07387
2388	UPCHNL	A	0572, X10	UPDATE		11	07443	A	09654 00074
2389		A	032, X15	IND REG 10015		11	07454	A	09583 00099
2390		DCE	N10XIT, X10, F	BRCH IF ALL CHNL CHK		12	07465	B	07579 00074 F
2391		B	N10010	GO CHK NEXT CHNL		7	07477	J	07330
2392	GOJIT	MLNS	FILE1, RDYMSG00	MOVE MOD ADDR		12	07484	D	09692 07523 1
2393		MLNS	INCODE, RDYMSG012	MOVE CHANNEL NUMBER		12	07496	D	07380 07527 1
2394		B	TYPI			7	07508	J	01593

DATA TYPE
OPERAND

LABEL

PC

2404	RDYKSG	DCM	DTST MOD	CH 2.G	13	07515	
2405	CHNL SH	NDPUN			1	07529	N
2406		B	NUCHNL	CHANNEL SWITCH	7	07530	J 07555
2407		ZA	EN07.X3	LOAD IX 3	11	07537	Q 09659 00039
2408		B	0EX3		7	07548	J 000H0
2409	NUCHNL	CH	CHNLSW61	TURN OFF CHANNEL SW	6	07555	Q 07530
2410		ZA	EN01.X3	LOAD IX 3	11	07561	Q 09664 00039
2411		B	0EX3		7	07572	J 000H0
2412	N18X17	B	MONITR	GO TO MONITOR	7	07579	J 02066
2413							

TEST OVERLAP FILES AND TAPES

DA03

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CT ADDR INSTRUCTIONS

PGLIN LABEL

OPCODE OPERAND

2416 *** TEST ROUTINE DESCRIPTION ***
2417 *** TEST FILES & TAPES OVERLAPPED ***
2418 THIS ROUTINE USES FILES ON EVERY CHANNEL WHICH HAS THEM, ON
2419 CHANNELS WHICH DO NOT HAVE FILES, TAPES ARE USED. IF NEITHER FILES
2420 OR TAPES ARE AVAILABLE THE CHANNEL IS BY-PASSED. STARTING WITH
2421 CHANNEL 1 AN OVERLAPPED WRITE OP IS GIVEN TO FILES OR TAPE. THEN
2422 CHANNEL 2 IS STARTED AND THEN 3 AND 4. CHANNEL 1 IS CHECKED AGAIN
2423 IF IT IS IN OVERLAP CHANNEL 2 IS CHECKED AND SO ON, WHEN A CHANNEL
2424 IS FOUND TO BE OUT OF OVERLAP ANOTHER WRITE IS INITIATED ON THE
2425 CHANNEL. AFTER 500 WRITES HAVE BEEN ISSUED THE FILES ARE ISSUED
2426 READ OPS, WHEN 500 READS HAVE BEEN INITIATED THE OVERLAP OP-
2427 ERATIONS ARE STOPPED. THE PROGRAM DELAYS FOR 1.5 SECONDS AND THEN
2428 EVERY CHANNEL THAT WAS USED IS CHECKED FOR OVERLAP IN PROCESS. IF
2429 ANY ARE FOUND TO BE IN PROCESS AN ERROR IS INDICATED, FOR CH1
2430 ERROR 32, FOR CH2 ERROR 33, FOR CH3 ERROR 34, FOR CH4 ERROR 35. ALL
2431 STATUS ERRORS WILL BE INDICATED ALSO.
2432 FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2433 DATA FIELD USED FOR FILES ON CYL 253 ADDRESS 9#20
2434

DATA FIELD USED FOR TAPES TAPE UNIT 1

N19	NCP	ROUTINE ID			
2435	DC	2192	BRCH IF OVERLAP AVAIL	1	07586 N
2436	BCE	*68,1263,1		2	07588
2437	B	N19XIT		12	07589 B 07608 01263 1
2438	BCE	OVLRSST, SPTADO, 1	BRCH IF MANUAL OPERATION	7	07601 J 08385
2439	B	N19XIT		12	07608 B 09946 01004 1
2440	CW	RORWF81, ERRORF81	CLEAR RD OR WRT SW	7	07620 J 08385
2441	CW	ERRONT81, CKCHL181	CLEAR ERROR SW	11	07627 H 07833 07060
2442	CW	CKCH1181, CKCH1281		11	07638 H 08033 07891
2443	HLNA	2002, FILE81	RESET ACCESS AND MOD ADDR	11	07649 H 07974 08004
2444	ZA	213082, X10	LOAD IX 10	12	07660 D 09666 09692 /
2445	ZA	212912, X11	LOAD IX 11	11	07672 M 09670 00074
2446	ZA	2000002, X12	LOAD IX 12	11	07683 M 09674 00079
2447	BCE	MOVCD, 06X10, F	FILES AVAIL	11	07694 M 09609 00084
2448	BCE	MOVCD, 06X11, 1	TAPES AVAIL	12	07705 B 07781 00000 F
2449	A	2572, X10	UPDATE IX 10	12	07717 B 07781 00000 1
2450				11	07729 A 09654 00074

PGL IN	LABEL	OPCCD	OPERAND		CT	ADDRS	INSTRUCTION
2452		A	2570,X11	UPDATE IX 11	11	07740	A 09654 00079
2453		A	232,X12	UPDATE IX 12	11	07751	A 09583 00084
2454		BCE	RESEIX,X10,F	BRCH IF MOD CHKD	12	07762	B 07672 00074 F
2455		B	FILEI	GO FIND FILE OR TAPE	7	07774	J 07705
2456	POVCOD	MLCA	OCODE3CX12,INITL1	MOVE CHNL OVLP CCDES	12	07781	D 09E49 07812 I
2457		B	CHALTR	GO TO CHANNEL ALTER	7	07793	J 01045
2458		DCH	FRCH		5	07804	08102
2459		DC	TO		5	07809	C-1840
2460		DCW	222		1	07810	
2461		DC	2R2		1	07811	
2462	INITL1	DC	212		1	07812	
2463		BCE	*28,0EX10,F	FILE OR TAPE AVAIL	12	07813	B 07832 00...0 F
2464		B	TAPEOP		7	07825	J 08001
2465	RORWF	NCPWM			1	07832	N
2466		B	RDFILE	READ - WRITE SW	7	07833	J 07918
2467	' TO	MRCNG	HACP,DATAFD	LOAD THE DATA FIELD	12	07840	D 09383 09700 L
2468		BCL1	UPINDX	BRCH ON OVERLAP	7	07852	J 07729 I
2469	ERRONF	NCPWM			1	07859	N G
2470		BA1	FILERW	BRCH ON ANY IND	7	07860	R 07884 H
2471		LU	2F5,FILE,W	WRITE HAD OVERLAP	10	07867	L 2AF5 09691 W
2472		B	WRICNT	GO TO WRITE COUNT	7	07877	J 08116
2473	FILERW	SW	CKCHL121		6	07884	, 07891
2474	CKCHL1	NCPWM			1	07890	N G
2475		BA1	*C1	CLEAR I/O INTRLK ON	7	07891	R 07898 H
2476		CW	CKCHL121	CHANNEL 1	6	07898	D 07891 G
2477		BA1	STACHK	GO TO STATUS CHECK	7	07904	R 03298 H
2478		B	FILERW-17		7	07911	J 07867
2479	RDFILE	CS	DATAFDE99	CLEAR DATA FIELD	6	07918	/ 09799
2480		PLCHS	G 2M2,DATAFDE100	SET FIELD LENGTH	12	07924	D 09575 09800 7
2481		BCL1	UPINDX	BRCH OVL-IN-PROCESS	7	07936	J 07729 I G
2482		BA1	FILERR	BRCH ON ANY ERRCR	7	07943	R 07967 M
2483		LU	2F5,FILE,R	READ HAD OVERLAP	10	07950	L 2AF5 09691 R
2484		B	RDCNT	GO TO READ COUNT	7	07960	J 08091
2485	FILERR	SW	CKCHL121		6	07967	, 07974
2486	CKCHL1	NCPWM			1	07973	N G
2487		BA1	*21	CLEAR I/O INTRLK ON	7	07974	R 07981 M

TEST OVERLAP FILES AND TAPES

PGM IN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
2487		CH	CKCH1161	6	07981	H 07974
2488		BAI	STACHK	7	07987	R 03298 H
2489		B	FILERR-17	7	07994	J 07950
2490	TAPEOP	HLCHS	0000,DATAFD06244	12	08001	D 09575 09944 7
2491		BOLI	UPINDEX	7	08013	J 07729 1
2492		MRCHG	ADDR1,DATAFD06101	12	08020	D 09390 09801 P
2493	ERRORNT	NOPWM		1	08032	N
2494		BAI	TAPERW	7	08033	R 08057 H
2495		LU	001,DATAFD06101,H	10	08040	L 081 09801 H
2496		B	WRTCNT	7	08050	J 08116
2497	TAPERW	SW	CKCH1261	6	08057	, 08064
2498	CKCH12	NOPWM		1	08063	N
2499		BAI	061	7	08064	R 08071 H
2500		CH	CKCH1261	6	08071	H 08064
2501		BAI	STACHK	7	08077	R 03298 H
2502		B	TAPERW-17	7	08084	J 08040
2503	ROBNT	A	010,OVLCNT	11	08091	A 09577 09521
2504	FROM	BZ	CHKOVL	7	08102	J 08170 V
2505		B	UPINDEX	7	08109	J 07729
2506	WRTCNT	A	010,OVLCNT	11	08116	A 09577 09521
2507		SW	ERRONF01,ERRONT01	11	08127	, 07860 00033
2508		BCE	SETROF,OVLCNT-2,5	12	08138	B 08157 09519 5
2509		B	UPINDEX	7	08150	J 07729
2510	SETROF	SH	RORWF01	6	08157	, 07833
2511		B	UPINDEX	7	08163	J 07729
2512	CHKOVL	S	DELAY	6	08170	S 09526
2513	HAIT	A	010,DELAY	11	08176	A 09577 09526
2514		BZ	068	7	08187	J 08201 V
2515		B	HAIT	7	08194	J 08176
2516		BCE	068,1268,1	12	08201	B 08220 01268 1
2517		B	CKOVL2	7	08213	J 08247
2518		BOLI	068	7	08220	J 08234 1
2519		B	067	7	08227	J 08240
2520			*** SET ERROR 32 ON ***			
2521		SW	E32	6	08234	, 01033
2522			CHANNEL 1 HUNG IN OVERLAP IN PROCESS			

*** SET ERROR 32 ON ***

SW E32 SET ERROR IND

CHANNEL 1 HUNG IN OVERLAP IN PROCESS

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DA03

END TEST ROUTINE

CT	ADDRS	INSTRUCTION
0000	0000	0000000000000000
0001	0001	0000000000000000
0002	0002	0000000000000000
0003	0003	0000000000000000
0004	0004	0000000000000000
0005	0005	0000000000000000
0006	0006	0000000000000000
0007	0007	0000000000000000
0008	0008	0000000000000000
0009	0009	0000000000000000
0010	0010	0000000000000000
0011	0011	0000000000000000
0012	0012	0000000000000000
0013	0013	0000000000000000
0014	0014	0000000000000000
0015	0015	0000000000000000
0016	0016	0000000000000000
0017	0017	0000000000000000
0018	0018	0000000000000000
0019	0019	0000000000000000
0020	0020	0000000000000000
0021	0021	0000000000000000
0022	0022	0000000000000000
0023	0023	0000000000000000
0024	0024	0000000000000000
0025	0025	0000000000000000
0026	0026	0000000000000000
0027	0027	0000000000000000
0028	0028	0000000000000000
0029	0029	0000000000000000
0030	0030	0000000000000000
0031	0031	0000000000000000
0032	0032	0000000000000000
0033	0033	0000000000000000
0034	0034	0000000000000000
0035	0035	0000000000000000
0036	0036	0000000000000000
0037	0037	0000000000000000
0038	0038	0000000000000000
0039	0039	0000000000000000
0040	0040	0000000000000000
0041	0041	0000000000000000
0042	0042	0000000000000000
0043	0043	0000000000000000
0044	0044	0000000000000000
0045	0045	0000000000000000
0046	0046	0000000000000000
0047	0047	0000000000000000
0048	0048	0000000000000000
0049	0049	0000000000000000
0050	0050	0000000000000000
0051	0051	0000000000000000
0052	0052	0000000000000000
0053	0053	0000000000000000
0054	0054	0000000000000000
0055	0055	0000000000000000
0056	0056	0000000000000000
0057	0057	0000000000000000
0058	0058	0000000000000000
0059	0059	0000000000000000
0060	0060	0000000000000000
0061	0061	0000000000000000
0062	0062	0000000000000000
0063	0063	0000000000000000
0064	0064	0000000000000000
0065	0065	0000000000000000
0066	0066	0000000000000000
0067	0067	0000000000000000
0068	0068	0000000000000000
0069	0069	0000000000000000
0070	0070	0000000000000000
0071	0071	0000000000000000
0072	0072	0000000000000000
0073	0073	0000000000000000
0074	0074	0000000000000000
0075	0075	0000000000000000
0076	0076	0000000000000000
0077	0077	0000000000000000
0078	0078	0000000000000000
0079	0079	0000000000000000
0080	0080	0000000000000000
0081	0081	0000000000000000
0082	0082	0000000

OPCODE OPERAND

LABEL

PGLIN

[illegible]

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PREPARE 1 INST LOOP & DATA FIELD

DA03
CT ADDR INSTRUCTION

PGLIN LABEL

OPCCD OPERAND

2568 *** PREPARE ONE INSTRUCTION LOOP AND DATA FIELD ***
 2569 *** ACCORDING TO CE REQUEST ***
 2570 WHEN THE CE SELECTS THE PROGRAM OPTION FOR ONE INSTRUCTION LOOP
 2571 ING, THIS ROUTINE TAKES THE DATA ENTERED BY THE CE AND BUILDS THE
 2572 DATA FIELD AND LOOP INSTRUCTION FROM IT. WHEN IT HAS COMPLETED
 2573 THIS IT POSITIONS THE ACCESS TO THE ADDRESS ENTERED AND BRANCHES
 2574 TO THE LOOP ROUTINE.
 2575

2576	PREP	MLCA	226, RECAD	STORE LOOP DATA	12	08435	D	00226	09301	F
2577		CS	299	CLEAR CNTL FLD	6	08447	/	00299		
2578		ZA	ADR1, X10	LOAD IX 10	11	08453	M	09319	00074	
2579		SW	DATAFD	CLEAR	6	08464	,	09700		
2580	CLEAN7	CS	0EX10	THE	6	08470	/	00000		
2581		SBR	X10	DATA	7	08476	C	00074	B	
2582		BW	CLEAN7, DATAFD	FIELD	12	08483	V	08470	09700	I
2583		MLCB	XCTL1-1, LOOP&1	SET MODE & CHANNEL	12	08495	D	09278	01014	L
2584		MLCS	XCTL1, LOOP&3	SET SPECIFIC OPER	12	08507	D	09279	01016	3
2585		MLCS	XCTL1&1, LOOP&9	SET MODIFIER	12	08519	D	09280	01022	3
2586		ZA	NOFCHR, X8	LOAD IND REG 8	11	08531	M	09294	00064	
2587		ZA	NOFREC, WORK1	ADD NO. OF RECORDS	11	08542	M	09290	09304	
2588		A	262, NOFCHR	INCREASE CHAR COUNT	11	08553	A	09675	09294	
2589		M	NOFCHR, WORK2	RECORDS X CHARS	11	08564	2	09294	09309	
2590		ZA	WORK2, X9	LOAD RESULT INTO IX9	11	08575	M	09309	00069	
2591		MLCS	NOFCHRE1, DATAFD		12	08586	D	09295	09700	3
2592		MLCS	BOSIO, LOOP&10	ALTER B-0-S-I-O OP	12	08598	D	09281	01023	3
2593		MLCA	HA2, FILE&7		12	08610	D	09287	09698	F
2594		S	WORK2	RESET WORK 2	6	08622	S	09309		
2595		MLCS	LOOP&1, &E2		12	08628	D	01014	08641	3
2596		SD	1, FILE	POSITION THE ACC	10	08640	M	2FO	09691	H
2597		BCB1	*-16		7	08650	R	08640	2	G
2598		BAL	*E1		7	08657	R	08664	M	
2599		MLCS	LOOP&3, *E12	MOVE THE OP CODE	12	08664	D	01016	08607	3
2600		BCE	SRO, SPECOD,	IS THE OP CODE 1	12	08676	B	08718	09314	
2601		BCE	TRO	IS THE OP CODE 2	6	08688	B	08767		
2602		BCE	HAO	IS THE OP CODE 5	6	08694	B	08848		
2603		BCE	TWA	IS THE OP CODE 6	6	08700	B	08971		

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DA03

INSTRUCTION

CT

ADDRES

INSTRUCTION

PREPARE 1 INST LOOP & DATA FIELD

PGLIN

OPCCD

OPERAND

LABEL

2604	BCE	WFC	IS THE OP CODE 7	6	08706	B 09071
2605	H	PRGCTL	SPECIFIC OP INCORRECT	6	08712	• 02250
2606	MLCA	RECADD,FILEE7	LOAD REC ADDR	12	08718	D 09301 09698 I
2607	SW	DATAFDE8	LOAD	6	08730	• 09P00 I
2608	MRCW	DATAFD,DATAFDE1	DATA	12	08736	D 09700 09701 M
2609	MLCWS	2M2,DATAFDE8X8	FIELD	12	08748	D 09575 09P00 7
2610	B	LOOP810		7	08760	J 01023
2611	ZA	NOFREC,WORK1	ADD NO. OF RECCDS	11	08767	M 09290 09304
2612	S	262,NOFCHR	RESET NOFCHR COUNT	11	08778	S 09675 09294
2613	M	NOFCHR,WORK2	RECORDS X CHARS	11	08789	2 09294 09309
2614	ZA	WORK2,X9	LOAD RESULT INTO IX9	11	08800	M 09303 00069
2615	SW	DATAFDE8X9	THE	6	08811	• 09P40 I
2616	MRCW	DATAFD,DATAFDE1	DATA	12	08817	D 09700 09701 M
2617	MLCWS	2M2,DATAFDE8X9	FIELD	12	08829	D 09575 09P40 7
2618	B	LOOP810		7	08841	J 01023
2619	A	222,X9		11	08848	A 09590 00069
2620	ZA	2000002,X8	RESET IND REG 8	11	08859	M 09609 00064
2621	SW	DATAFDE8X9	LOAD	6	08870	• 09P40 I
2622	MRCW	DATAFD,DATAFDE1	DATA	12	08876	D 09700 09701 M
2623	MLCWS	2M2,DATAFDE8X9	FIELD	12	08888	D 09575 09P40 7
2624	MRC	HA2-1,DATAFD	LOAD HA2 ADDR	12	08900	D 09286 09700 #
2625	MLCA	RECADD,DATAFDE76X8	LOAD	12	08912	D 09301 09P07 I
2626	S	212,NOFREC	THE	11	08924	S 09577 09290
2627	BZ	LOOP810		7	08935	J 01023 V
2628	A	NOFCHR,X8	ADDR	11	08942	A 09294 00064
2629	A	212,RECADD	IN	11	08953	A 09577 09301
2630	B	LOADDR	THE DATA FLD	7	08964	J 08912
2631	SW	DATAFDE8X9	LOAD	6	08971	• 09P40 I
2632	MRCW	DATAFD,DATAFDE1	DATA	12	08977	D 09700 09701 M
2633	MLCWS	2M2,DATAFDE8X9	FIELD	12	08989	D 09575 09P40 7
2634	ZA	2000002,X8	LOAD	11	09001	M 09609 00064
2635	MLCA	RECADD,DATAFDE56X8	THE	12	09012	D 09301 09P05 I
2636	S	212,NOFREC	RECORD	11	09024	S 09577 09290
2637	BZ	LOOP810		7	09035	J 01023 V
2638	A	NOFCHR,X8	INTO	11	09042	A 09294 00064
2639	A	212,RECADD	THE	11	09053	A 09577 09301

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PREPARE 1 INST LOOP & DATA FIELD

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PGLIN	LABEL	OPCODE	OPERAND	DATA FIELD	CT	ADDRS	INSTRUCTION
2640		B	LOCADD		7	09064	J 09012
2641	WFO	SW	DATAFD&2205	LOAD DATA	6	09071	, 11965
2642		MRC	DATAFD, DATAFD&1	FIELD	12	09077	D 09700 09701 W
2643		MLCA	HAAREA, DATAFD&23	LOAD THE	12	09089	D 09347 09723 T
2644		S	&2&, NOFCHR	RESET NO. OF CHAR	11	09101	S 09675 09294
2645		ZA	NOFREC, WORK1	DETERMINE THE END	11	09112	M 09290 09304
2646		A	&1&, NOFCHR&1	ADDRESS AREAS	11	09123	A 09577 09295
2647		SW	DATAFD&30	AND	6	09134	, 09730
2648		MLCS	NOFCHR&1, DATAFD&41		12	09140	D 09295 09741 3
2649		MLCB	DATAFD&41, DATAFD&40	GAP	12	09152	D 09741 09740 L
2650		MLCS	DATAFD&41, DATAFD&52 LOAD		12	09164	D 09741 09752 3
2651		MLCS	DATAFD&41, DATAFD&63	SHORT GAPS	12	09176	D 09741 09763 3
2652		A	&3&&, NOFCHR	AREAS INTO	11	09188	A 09677 09294
2653		ZA	NOFCHR, X9	THE FORMAT	11	09199	M 09294 00069
2654	LODFOR	MLCA	DATAFD&63, DATAFD&63&X9	FIELD	12	09210	D 09763 09763 T
2655		S	&1&, NOFREC	REDUCE REC COUNT BY 1	11	09222	S 09577 09290
2656		BZ	&619		7	09233	J 09258 V
2657		A	NOFCHR, X9		11	09240	A 09294 00069
2658		B	LODFOR		7	09251	J 09210
2659		MLCNS	&2&&, DATAFD&31&X9	TERMINATING WNGN	12	09258	D 09575 09711 7
2660		B	LODF&10		7	09270	J 01023

PAGE INSTRUCTION

CONSTANTS
ORCODE OPERAND

LABEL

PCOUNT

2698		DCW	25332	3	09555
2699		DCW	25148	3	09556
2700	BLANK	DCW	2 2.6	4	09559
2701	INTERST	B	N17XIV	7	09564 J 07313
2702		DCW	25A	1	09571
2703		UTORG	•		09572
2703			25A	1	09572
2703			25A	1	09573
2703			25A	1	09574
2703			25A	1	09575
2703			2 2	1	09576
2703			25A	1	09577
2703			2002092	5	09582
2703			232	1	09583
2703			272	1	09584
2703			2002372	5	09589
2703			222	1	09590
2703			2099952	5	09595
2703			2012	2	09597
2703			2000012	5	09602
2703			2512	2	09604
2703			2000002	5	09609
2703			23172	3	09612
2703			2013002	5	09617
2703			N10	5	09622 07320
2703			2000002	4	09626
2703			290202	4	09630
2703			242	1	09631
2703			2312	2	09633
2703			292002	4	09637
2703			290002	4	09641
2703			23002	3	09644
2703			N11	5	09649 06217
2703			252	1	09650
2703			2592	2	09652
2703			2572	2	09654

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CT	ADDRS	INSTRUCTION
DA03		

CONSTANTS

OPCCD OPERAND

PCLIN LABEL

2703	N07				5	09659	05340
2703	N01				5	09664	04267
2703	20C2				2	09666	
2703	213082				4	09670	
2703	212912				4	09674	
2703	262				1	09675	
2703	2382				2	09677	
2704	9691	ORG				09691	
2705	2000000C882,G	DCW			8	09691	
2706	2 2	DC			1	09700	
2707	245	DS				09945	
2708	OVLRSI	NCPWM		BLOW OUT PATCH 1 APRIL 64	1	09946	N
2709	PASS2	B			7	09947	J 09985
2710	OVLRSI21	SW			6	09954	• 09947
2711	TYP1	B			7	09960	J 01593
2712	2CCMP RESET&START2,G	DCW			16	09982	
2713		H			1	09984	•
2714	PASS2	CW			6	09985	□ 09947
2715	N19841	B			7	09991	J 07627
2716		H			1	09998	•
2717	END						J

BLOW OUT PATCH 1 APRIL 64

END OF ASSEMBLY

6.04.00.0 7631 ELECTRONIC TEST DESCRIPTION

This is an update to DA04D. It is enlarged to test flagging and flag detection abilities and to test more thoroughly the HAO, Write Inhibit and Write Format switches. In addition, the new level incorporates the standard features previously described in this package.

Beginning with a reset of the machine, the program starts with as simple an operation as possible and builds upward to more complex operations and tests. The program runs through 26 test routines in either the manual or automatic mode. Although both modes require manual intervention, the automatic requires far less than the manual mode, but the manual mode is a more thorough test. The program uses only 1301 module 0, all other modules are bypassed and must be set inoperative. Every 7631 available on every channel will be tested starting with channel 1 through 4.

The program does not require that the home addresses be present or correct, and data on the customer's tracks is not disturbed.

6.04.01.1 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program. In addition, the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

- A. Write format on (1301 module 0 on each channel to be tested)
- B. HAO switch on (on all 7631's to be tested)
- C. CE-HAO switch on (on all 7631's to be tested)
- D. 1301 modules 1-9 are set inoperative (all channels being tested)
- E. All other 7631-1301 switches are off.
- F. Check control switch to reset and restart (1410 console).

01.2 SPECIAL REQUESTS

- A. "HAO, CE-HAO, WRT FMT ON, SEL MODE"

This reminds the CE to insure the switches are on and requests that the mode be selected. If the CE enters a "1," manual mode is run; if a 1 is entered, automatic mode is run.

6.04.01.0 OPERATING PROCEDURE (continued)

B. "COMP RESET, CHK 7631"

The CE presses Computer Reset, checks the lights on the 7631 to insure that it is reset, and then presses Start.

C. "ACC TO CYL 000" (Manual mode only)

The CE manually sets the access on 1301 module 0 to cylinder 000. Press Start.

D. "ACC TO CYL 110" (Manual mode only)

The CE manually sets the access to cylinder 110. Press Start.

E. "ACC TO CYL 194" (Manual mode only)

The CE sets the access to cylinder 194. Press Start.

F. "ACC TO CYL 253"

The CE checks the access to insure it has positioned itself properly at cylinder 253, then presses Start.

G. "# OF SPARE HEADS"

The CE enters the number of spare heads available for writing on alternate surfaces (should enter 2, 4 or 6).

H. "CE-HAO OFF"

CE turns off CE-HAO switch and presses Start.

I. "CYO"

CE enters 1 if Cyo feature is available.

J. "MOD 3"

CE enters 1 if 7631 is a model III.

K. "HAO & WRT FMT SWS OFF" (Manual mode only)

CE turns off HAO and write format switches on 7631 being tested.

6.04.01.1 OPERATING PROCEDURE (continued)

L. "WRITE INHIBIT AND HAO SWS ON" (Manual mode only)

CE turns on write inhibit and HAO switches on 7631 being tested.

M. "WRT INHIBIT OFF, HAO & CE-HAO SWS ON"

CE turns off write inhibit, turns on HAO and CE-HAO switches on 7631 being tested.

N. "PASS, SWS OFF"

When test is complete, this reminds the CE to turn off 7631 switches before continuing.

01.3 SPECIAL TAD'S

There is one special TAD for this program (memory location 01005). This TAD is set when the mode is selected; if it is set to 1, manual mode is run, if it is set to $\bar{1}$ automatic mode is run. This TAD is set to $\bar{1}$ when the program is loaded.

01.4 STANDARD OPTIONS

Two of the standard options are not available with this program, they are:

A. Alter Routine Sequence - Code 3

B. One Instruction Loop - Code 5

01.5 MANUAL MODE

When running in the manual mode, the following tests are run which are not run in the automatic mode.

A. Test 7631 Track Register

Routines N06, N07, and N08

B. Test HAO, Write Format, and Write Inhibit Switches

Routine N24

01.6 SUMMARY TYPEOUT

The summary of errors typeout is not available with this program.

6.04.02.0 OPERATING HINTS

02.1 SELECTING MANUAL MODE (ALTER SPECIAL TAD)

If the mode selected when the program is first loaded must be changed, use program option code 2 (alter memory) to change memory location 01005 to a 1 or 1.

02.2 LOOPING ROUTINES

Certain routines make requests during their operation for switch settings. These requests must be honored for valid operation.

6.04.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None

03.2 NORMAL STOPS

<u>Memory Location</u>	<u>Reason</u>
03554	Wait for CE to press Computer Reset and Start.
04509	Wait for CE to position ACC at cycle 000 (manual mode only).
04651	Wait for CE to position ACC at cycle 110 (manual mode only)
04793	Wait for CE to position ACC at cycle 194 (manual mode only)
04971	Wait for CE to insure ACC is at cycle 253.
07166	Wait for CE to turn off CE-HAO (manual mode)
08640	Turn off write format and HAO switches (manual mode)
08843	Turn on write inhibit and HAO switches (manual mode)
09056	Turn off write inhibit, turn on CE-HAO
09321	Reset all switches

6.04.04.0 TYPEOUTS (OTHER THAN REQUESTS AND STANDARD TYPE-OUTS)

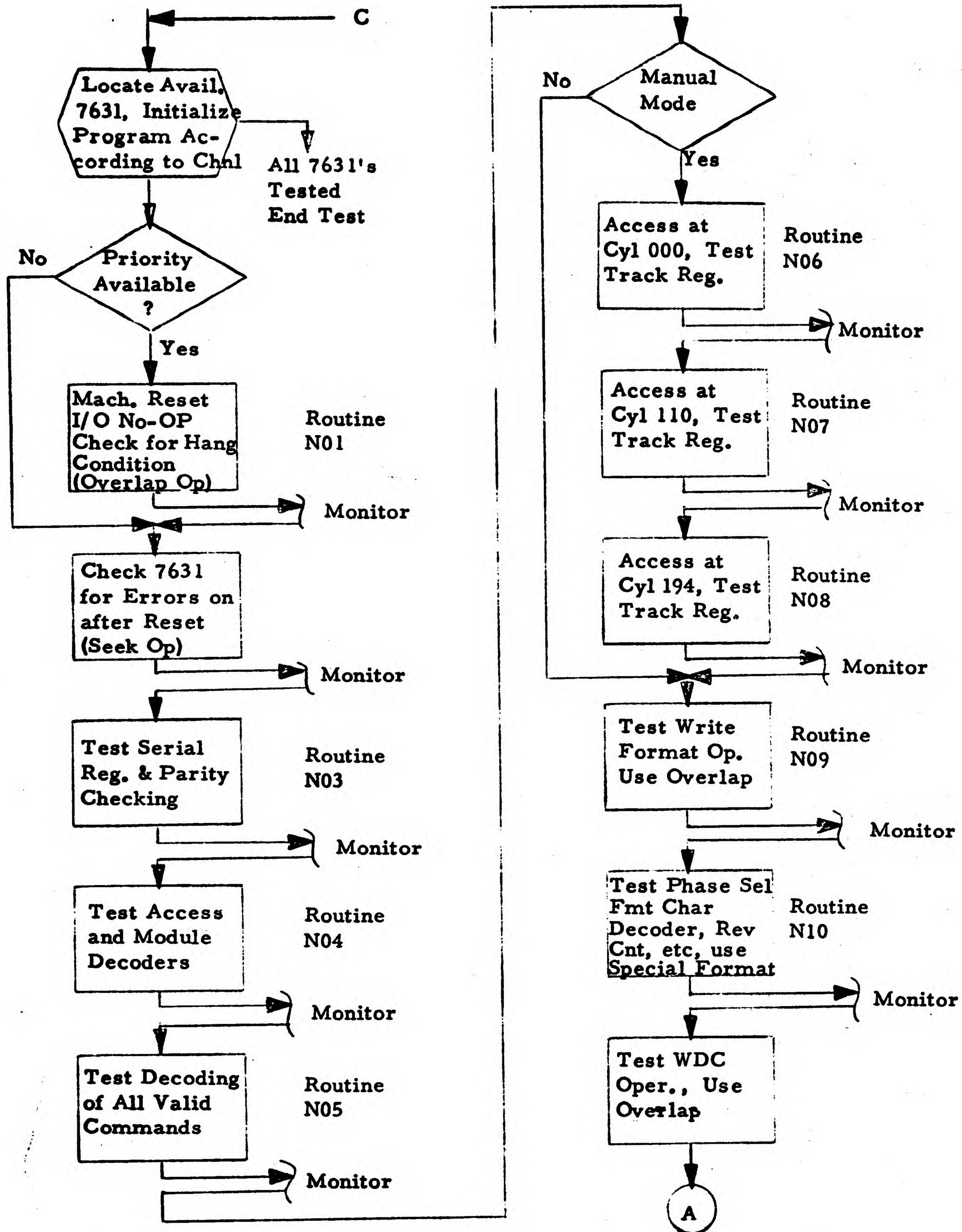
04.2 "TST CH0"

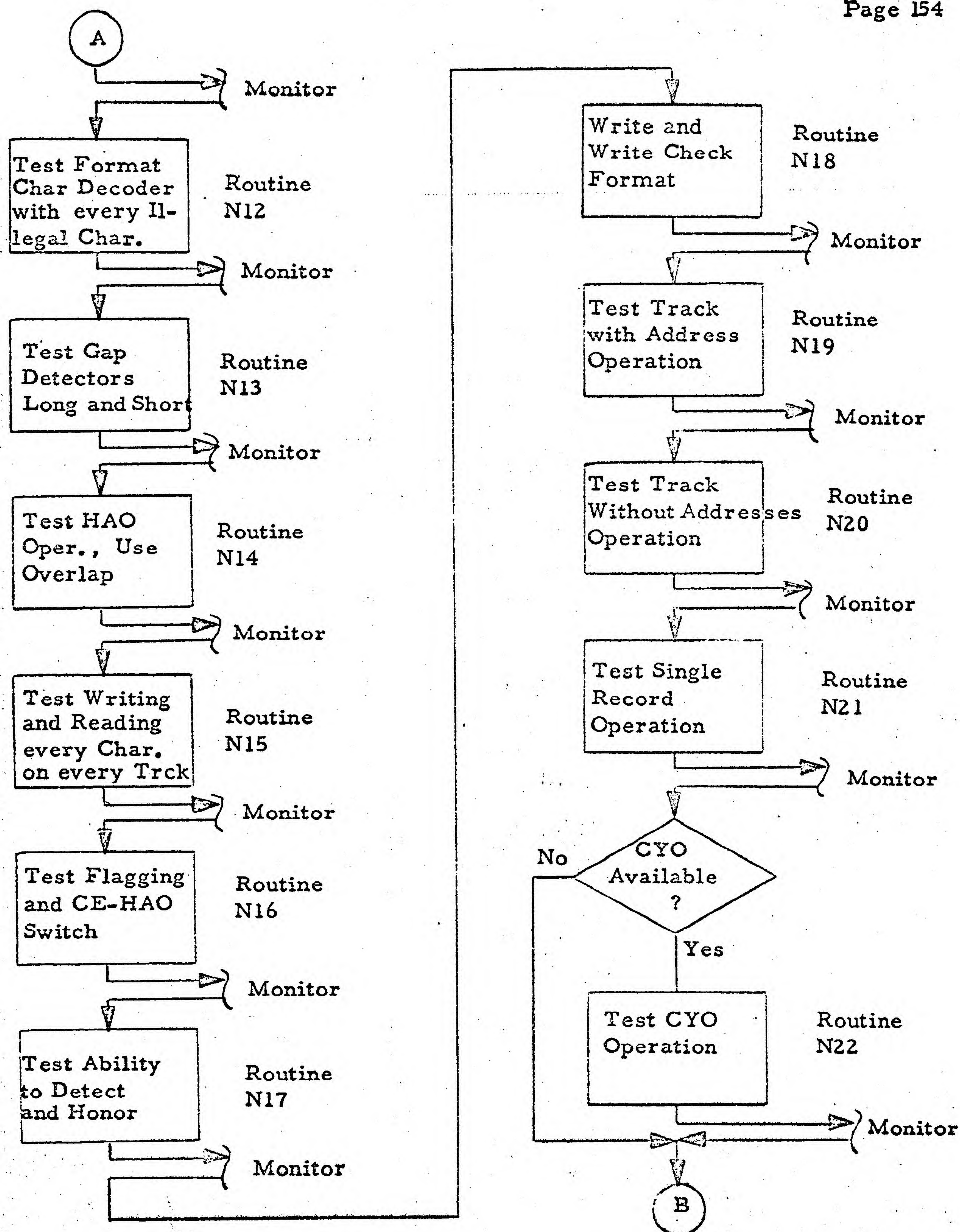
This tells the CE which channel is being tested.

- 04.2 Following the standard error message a third line of data, pertinent to the error, will be given with some errors. This will be the setting of the E or B register after the file op or the file address being used. Refer to the individual test routines for details.

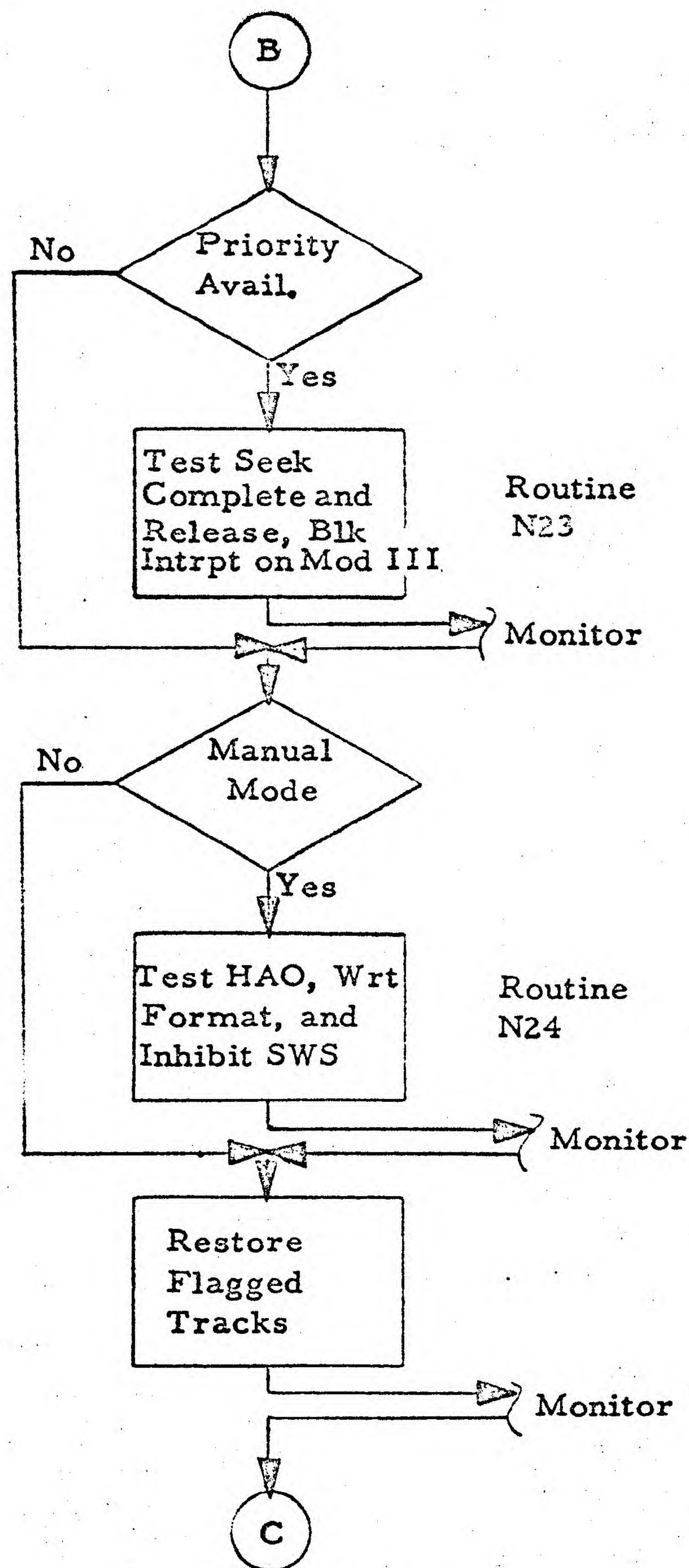
6.04.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.





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Go Find and Test
Next 7631

6.04.06.0 ROUTINE/ERROR INDEX DA04

This index should be used to locate routines and errors in the program listing.

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6.04.06.0 ROUTINE/ERROR INDEX DA04 (continued)

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	45	209
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N20	47	211
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	53	216
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DA04

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NOTES

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I/O DICOST DEFINE TADS

CT ADDR INSTRUCTION

PCLIN LABEL

OPCOD OPERAND

1002	CIL	2			
1003	LINES	36			
1004	DEFINE STANDARD TADS				
1005					
1006	ORG	1000		01000	
1007	TADO	2 2	1	01000	
1008	TADI	2 2	1	01001	
1009	TAD2	2 2	1	01002	
1010	TAD3		1	01003	
1011					
1012					
1013					
1014	SPIADO	2 2	1	01004	
1015	SPIADI	2 2	1	01005	
1016	SPIAD2	2 2	1	01006	
1017	SPIAC3	2 2	1	01007	
1018	SPIAD4	2 2	1	01008	
1019	SPIAD5	2 2	1	01009	
1020	SPIAD7	2 2	1	01010	
1021	SPIAD8	2 2	1	01011	
1022	SPIAD9	2 2	1	01012	
1023					

DEFINE SPECIAL TADS

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I/O DICOST ONE INSTRUCTION LOOP

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CT ADDR INSTRUCTION

PGLIN LABEL

OPCOD OPERAND

```

1025      *** I/O DICOST PROGRAM ***
1026      *** ONE INSTRUCTION LOOP ROUTINE ***
1027      WHEN THE CE SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION
1028      IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED. NOTE THAT THE
1029      BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1030      LOOP      MU      $11,0,R      I/O INST BEING LUP N
1031      BA1      *$1
1032      BNQ      PRGCTL      BRCH ON INQ TO PRGCL
1033      B      LOOP      CONTINUE TO LOOP
1034      H
1035

```

10	01013	M	\$11	00000	R
7	01023	R	01030	M	
7	01030	J	02238	Q	
7	01037	J	01013		
1	01044	.			

I/O DICOST CHANNEL ALTER

CT ADDR INSTRUCTION

1037 *** I/O DICOST PROGRAM ***
1038 *** CHANNEL ALTER ROUTINE ***
1039 THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS, BRANCH-ON-STATUS-
1040 INDICATOR-CN INSTRUCTIONS, AND BRANCH ON CHANNEL OVERLAP IN PRO-
1041 CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED. THIS IS DONE
1042 BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRU-
1043 TIONS.

PGLIN	LABEL	OPCOD	OPERAND	STORE ADDR	CT	ADDR	INSTRUCTION
1044	CHALIR	SHR	X5		7	01045	G 00044 B
1045		MLCA	9EX5, X7	LOAD IX6 & IX7	12	01052	D 00119 00059 I
1046	SCAN	SCNLA	0EX6, 0EX6	SCAN FOR WM	12	01064	D 00110 00110 B
1047		SAR	X6	STORE ADDR OF OPER	7	01076	G 00054 A
1048		C	X6, X7	HAS ALL OF FLD BEEN	11	01083	C 00054 00059
1049		BH	13EX5	SEARCHED IF SD BRCH	7	01094	J 00113 U
1050		MLCS	1EX6, *E12	STORE OP CODE	12	01101	D 00111 01124 3
1051		BCE	MLORU, CODES,	IS OP CCDE M	12	01113	B 01149 02551
1052		RCE		IS OP CCDE L	1	01125	B
1053		BCE		IS OP CODE U	1	01126	B
1054		BCE		IS OP CODE R	6	01127	B 01168
1055		BCE	RX30R1	IS OP CODE X	1	01133	B
1056		RCE		IS OP CODE 3	1	01134	B
1057		BCE		IS OP CODE 1	1	01135	B
1058		BCE		IS OP CODE J	6	01136	B 01187
1059		B	JAY	GO FIND NEXT OPER	7	01142	J 01064
1060		MLCS	10EX5, 2EX6	CHEANGE CH-MODE CHAP	12	01149	D 00110 00112 3
1061	MLORU	B	SCAN	GO FIND NEXT OPER	7	01161	J 01064
1062		MLCS	11EX5, 1EX6	CHANGE B-I-S-I-O OP	12	01168	D 00111 00111 3
1063	RX30R1	B	SCAN	GO FIND NEXT OPER	7	01180	J 01064
1064		MLCS	7EX6, *E12	STORE MODIFIER	12	01187	D 00117 01210 3
1065	JAY	BCE	ONE234, MODS,	IS MODIFIER A 1	12	01199	B 01221 02555
1066		BCE		IS MODIFIER A 2	1	01211	B
1067		BCE		IS MODIFIER A 3	1	01212	B
1068		RCE		IS MODIFIER A 4	1	01213	B
1069		B	SCAN	GO FIND NEXT OPER	7	01214	J 01064
1070		MLCS	12EX5, 7EX6	CHANGE BOL MODIFIER	12	01221	D 00112 00112 3
1071	ONE234	B	SCAN	GO FIND NEXT OPER	7	01233	J 01064
1072							

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DA04 INSTRUCTION

CT ADDR

1 01240 .

I/O OICOST CHANNEL ALTER

OPCOD OPERAND

H

DEFINE SYSTEM & CHANNEL CONTROL CARDS

ORG 1233

DCW @FN2FJRFJZFJ1309+9@

DEFINE PROGRAM TITLE

ORG 1250

DCW @DA04E@,G

LOCATE THE SYSTEM & CHANNEL CARDS

ORG 1256

DC @

CHNL1 @

ORG 1289

DC @

CHNL2 @

ORG 1346

DC @

CHNL3 @

ORG 1403

DC @

CHNL4 @

ORG 1460

DC @

CHNL5 @

PGLIN

1073

1074

1075

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1080

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1100

1101

1102

1103

01233

17 01249

01250

5 01254

01256

50 01256

7 01312

01289

50 01289

7 01345

01346

50 01346

7 01402

01403

50 01403

7 01459

01460

50 01460

7 01516

I/O DICOST TYPE
OPCCD OPERAND

CI ADDR INSTRUCTION

1105 *** I/O DICOST PROGRAM ***
1106 *** TYPE AND REQUEST FOR INTERVENTION ***
1107 THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR
1108 MANUAL INTERVENTION. THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON
1109 DATA FIELD, OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE
1110 BRANCH INSTRUCTION TO THIS ROUTINE. IF A REPLY IS REQUIRED A READ
1111 CONSOLE PRINTER OPERATION IS ISSUED. THIS ROUTINE IS USED TO TYPE
1112 ALL MESSAGES IN THIS PROGRAM.
1113

1114	IYMS	SBR	IYXITC5	STORE RETURN ADDR	7	01517	G	01591	B
1115	TYPE	WCP	201	TYPE MESSAGE	10	01524	M	XIO 00201	W
1116		BCB1	TYPE	BRCH BUSY	7	01534	R	01524	2
1117		BAL	*E1		7	01541	R	01548	M
1118	SW11	NCPWM			1	01548	N		
1119	LAH60	RCP	0	READ CONSOLE PRINTER	10	01549	M	XIO 00000	R
1120		BEX1	*-16,M	BRCH ON ANY BUT WLR	7	01559	R	01549	M
1121		BAL	*E1		7	01566	R	01573	M
1122		CW	SW11E1	TURN OFF SWITCH 11	6	01573	M	01549	
1123		CS	330	CLEAR PRINT AREA	6	01579	/	00330	
1124		CS			1	01585	/		
1125	IYXIT	B	0	RETURN TO DICOST	7	01586	J	00000	
1126	TYPI	SHR	X1	STORE ADDR OF MSG	7	01593	G	00029	B
1127		B	*E14		7	01600	J	01620	
1128	IYPI2	SBR	X1	STORE ADDR OF MSG	7	01607	G	00029	B
1129		SW	REPLYE1	TURN ON REPLY SW	6	01614	.	01652	
1130		WCP	0EX1	TYPE MESSAGE	10	01620	M	XIO 000+0	W
1131		SBR	X1	STORE RETURN ADDR	7	01630	G	00029	B
1132		BCB1	*-23		7	01637	R	01620	2
1133		BAL	*E1		7	01644	R	01651	M
1134	REPLY	NCPWM		BRCH	1	01651	N		
1135		B	RDCON	IF REPLY REQUIRED	7	01652	J	01666	
1136		B	0EX1	RETURN	7	01659	J	000+0	
1137	RDCON	RCP	0EX1	REPLY TO MSG	10	01666	M	XIO 000+0	R
1138		SBR	X1	STORE RETURN ADDR	7	01676	G	00029	B
1139		BEX1	*-23,M	BRCH ON ANY BUT WLR	7	01683	R	01666	M
1140		BAL	*E1		7	01690	R	01697	M

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DA04 INSTRUCTION

I/O DICOST TYPE
OPCCO OPERAND

PGLIN LABEL

1141	CH	REPLYE1	6	01697	01652
1142	B	0EX1	7	01703	J 000+0
1143	DATA	a	12	01710	
1144	BCE	*E13,1264,1	12	01722	B 01746 01264 1
1145	MLCWS	2N2,MONITR27	12	01734	D 09804 02073 7
1146	MLCWS	2N2,PASS1	12	01746	D 09804 01944 7
1147	MRCWG	*E9,1230	12	01758	D 01778 01230 L
1148	B	PASS1E7	7	01770	J 01951
1149	H		1	01777	.
1150	DC	a.73a	3	01780	
1151	DCW	2J2	1	01781	
1152	DC	SCAN	5	01786	01064
1153	DC	a a	1	01787	
1154	DCW	a.a,G	1	01788	

*** ERROR TABLES THESE ARE USED FOR ERROR ***
*** SUMMARIES AND ERROR IDENTIFICATION ***

1159	ORG	*EX00		01800	
1160	ORG	*E1		01801	
1161	DCW	2L2	1	01801	
1162	DC	a a	1	01802	
1163		a a	1	01803	
1164		a a	1	01804	
1165		a a	1	01805	
1166		a a	1	01806	
1167		a a	1	01807	
1168		a a	1	01808	
1169		a a	1	01809	
1170		a a	1	01810	
1171		a a	1	01811	
1172		a a	1	01812	
1173		a a	1	01813	
1174		a a	1	01814	
1175		a a	1	01815	
1176	DC	a a	1	01816	

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I/O DICOST TYPE

CT ADORS INSTRUCTION

OPCCD OPERAND

LABEL

PCLIN

1E77	E16		2 2	1	01817
1E78	E17		2 2	1	01818
1E79	E18		2 2	1	01819
1E80	E19		2 2	1	01820
1E81	E20		2 2	1	01821
1E82	E21		2 2	1	01822
1E83	E22		2 2	1	01823
1E84	E23		2 2	1	01824
1E85	E24		2 2	1	01825
1E86	E25	DC	2 2	1	01826
1E87	E26	DC	2 2	1	01827
1E88	E27		2 2	1	01828
1E89	E28		2 2	1	01829
1E90	E29		2 2	1	01830
1E91	E30		2 2	1	01831
1E92	E31		2 2	1	01832
1E93	E32		2 2	1	01833
1E94	E33		2 2	1	01834
1E95	E34		2 2	1	01835
1E96	E35		2 2	1	01836
1E97	E36		2 2	1	01837
1E98	E37		2 2	1	01838
1E99	E38		2 2	1	01839
1200	E39		2 2	1	01840
1201	E40		2 2	1	01841
1202	E41		2 2	1	01842
1203	E42		2 2	1	01843
1204	E43		2 2	1	01844
1205	E44		2 2	1	01845
1206	E45		2 2	1	01846
1207	E46		2 2	1	01847
1208	E47		2 2	1	01848
1209	E48		2 2	1	01849
1210	E49		2 2	1	01850
1211	E50		2 2	1	01851
1212	E51	DC	2 2	1	01852

PGLIN LABEL I/O DICS1 TYPE
OPCOD OPERAND

CT ADDR INSTRUCTION

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1213	E52	a a	1	01853	
1214	E53	a a	1	01854	
1215	E54	a a	1	01855	
1216	E55	a a	1	01856	
1217	E56	a a	1	01857	
1218	ERRTAB	DC	1	01858	
1219		DC	1	01859	
1220					

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DA04

I/O DICOST INITIALIZE ROUTINE

CT ADDR INSTRUCTION

PGLIN LABEL

OPCCD OPERAND

*** INITIALIZE ROUTINE FOR THE DICOST PROGRAM ***

PRINT TITLE

INITLE WCP 1250

BC81 *-16

BA1 *E1

CS 99

SW 25

MLCS a+a,100

MRWR 25,30

MRCWG RESUME,1

MRCWG INTR,101

PASS1

B DATAE12

CW LPRT,SW11E1

CS E56

MLCWS aLa,STPIAB

B START

CLEAR AND RESET

ERROR TABLE

GO TO ROUTINE INIT.

*** RESET & INTERRUPT ROUTINES, THESE ROUTINES ***

*** ARE MOVED TO LOCATIONS 1 & 101

RETURN TO PROG CNTRL.

INTR BNQ PRGCTL

DCW aMa

R CKLUP

DCW aMa

BW MONITR,LPRT

BW LOOP,LPINST

MLNA X3,X2

B MONITR&7

CHECK FOR LOOP ROUT

CHECK INST LOOP SW

LOAD IX 2

GO TO MONITR

10	01860	M	210	01250	M
7	01870	R	01860	2	G
7	01877	R	01884	M	
6	01884	/	00099		
6	01890	.	00025		
12	01896	D	09805	00100	3
12	01908	D	00025	00030	2
12	01920	D	02015	00001	L
12	01932	D	02007	00101	L
7	01944	J	01722		
11	01951	D	02563	01549	
6	01962	/	01857		
12	01968	D	09806	01801	7
7	01980	J	03365		
1	01987	.			
	02000				
7	02000	J	01860		
7	02007	J	02238	Q	
1	02014				
7	02015	J	02023		
1	02022				
12	02023	V	02066	02563	1
12	02035	V	01013	02564	1
12	02047	D	00039	00034	/
7	02059	J	02073		

I/O DICOST MONITOR

CT ADDR INSTRUCTION

```

1253      *** I/O DICOST PROGRAM ***
1254      *** MONITOR ROUTINE ***
1255      THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED, OR
1256      A STATUS ERROR HAS BEEN DETECTED AND INDICATED. IN THE CASE OF A
1257      STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
1258      THE STATUS ERROR WAS DETECTED. WHEN ENTERED FROM THE END OF A
1259      TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY, THE
1260      ROUTINE IS BEING LOOPEL, ANY ERRORS OCCURED, ALTER ROUTINE SEQUENCE
1261      IS SELECTED, OR THE NEXT SEQUENTIAL ROUTINE SHOULD BE RUN.
1262

```

PGLIN	LABEL	OPCD	OPERAND	CT	ADDR	INSTRUCTION
1263	MONITR	SBR	X2	7	02066	G 00034 B
1264		BXPA	*E1	7	02073	Y 02080 X
1265		BNQ	PRGCTL	7	02080	J 02238 Q
1266	MONIT1	BW	0EX3,LPRT	12	02087	V 000M0 02563 1
1267	MONIT2	MLCWS	2M2,224	12	02099	D 09807 00224 7
1268		B	ERRCTL	7	02111	J 02623
1269	MONIT3	NOP		1	02118	N
1270		MLCHA	X2,X3	12	02119	D 00034 00039 X
1271		MLCWS	2 2,224	12	02131	D 09808 00224 7
1272		B	0EX2	7	02143	J 000.0
1273	WHERE2	MLCWS	2 2,224	12	02150	D 09808 00224 7
1274		BCE	*E8,0EX2,N	12	02162	B 02181 000.0 N
1275		B	0EX2	7	02174	J 000.0
1276		BZN	*E8,1EX2,2	12	02181	V 02200 000.1 2
1277		B	0EX2	7	02193	J 000.0
1278		BZN	*E8,2EX2,2	12	02200	V 02219 000.2 2
1279		B	0EX2	7	02212	J 000.0
1280		BW	MONIT3,3EX2	12	02219	V 02118 000.3 1
1281		B	0EX2	7	02231	J 000.0
1282						

I/O DICOST PROGRAM CONTROL

CT ADDR INSTRUCTION

PGLIN

OPCODE OPERAND

1284 *** I/C DICOST PROGRAM ***
 1285 *** PROGRAM CONTROL ***
 1286 WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
 1287 THIS ROUTINE IS ENTERED. THE CE ENTERS ON THE TYPEWRITER THE
 1288 OPTION CODE DESIRED, ALONG WITH THE DATA NEEDED BY THE OPTION. THE
 1289 ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
 1290 THE OPTION.

PGLIN	PRGCTL	RCPW	CTLFLD	READ THE CONSOLE PRT	CT	ADDR	INSTRUCTION
1291					10	02238	L \$10 00201 R
1292		SBR	X1		7	02248	G 00029 H
1293		BEX1	PRGCTL, M	BRCH ON ANY BUT WLR	7	02255	R 02238 M
1294		SW	CTLFLD E1		6	02262	, 00202 G
1295		BA1	*E1		7	02268	R 02275 M
1296		CH	LPRT, LPINST	TURN OFF LOOP SWS	11	02275	0 02563 02564
1297		MLWS	*E1	CLEAR WM IN ERROR	12	02286	0 02297 01802 4
1298		MRWR	E1, E2	TABLE	12	02298	0 01802 01803 4
1299		MLCS	CTLFLD, *E12	MOVE CTL CODE ENTERD	12	02310	0 00201 02333 3
1300		BCE	ENDTST, CTLCOD,	IS CTL CODE BLANK	12	02322	B 09294 02562
1301		BCE	ALTADS	IS CTL CODE 1	6	02334	B 02377
1302		BCE	ALTMEM	IS CTL CODE 2	6	02340	B 02400
1303		BCE	LUPRT	IS CTL CODE 4	6	02346	B 02447
1304		BCE	ONELUP	IS CTL CODE 5	6	02352	B 02476
1305		BCE	RSTART	IS CTL CODE 6	6	02358	B 02510
1306		BCE	CONT	IS CTL CODE 7	6	02364	B 02533
1307		B	PRGCTL		7	02370	J 02238
1308	ALTADS	MLCA	CTLFLD E4, 1003	MOVE IN NEW TADS	12	02377	D 00205 01003 I
1309		CS	MONIT1, 299	CLEAR OUT CTL FLD	11	02389	/ 02087 00299
1310		MLCA	CTLFLD E5, *E9	MOVE ADDR TO BE ALTR	12	02400	D 00206 02420 I
1311	ALTMEM	RCPW	0	ALTER MEMORY	10	02412	L \$10 00000 R
1312		BEX1	*-16, M	CHECK ALL BUT WLR	7	02422	R 02412 M
1313		BA1	*E1		7	02429	R 02436 M
1314		CS	MONIT1, 299	CLEAR THE CNTRL FLD	11	02436	/ 02087 00299
1315		SW	LPRT	TURN ON LOOP SWITCH	6	02447	, 02563
1316	LUPRT	MLNA	CTLFLD E5, X2	LOAD INO REG2	12	02453	D 00206 00034 /
1317		CS	MONIT2, 299	CLEAR CNTRL FLD	11	02465	/ 02099 00299
1318	ONELUP	SW	LPINST	TURN ON LOOP INST SW	6	02476	, 02564

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1320	LUPINT	NCPWH		1	02482	N
1321		B	*ER	7	02483	J 02497
1322		B	PREP	7	02490	J 09334
1323		CW	LUPINT&1	6	02497	D 02483
1324		B	LOCP	7	02503	J 01013
1325	RSTARI	MLNA	CTLFLD&5,X2	12	02510	D 00206 00034 /
1326		CS	MONIT2,299	11	02522	/ 02099 00299
1327	CUNT	CS	WHERE2,299	11	02533	/ 02150 00299
1328						
1329			I/C DICOST CONSTANTS			
1330	CODES	DCW	@J13XRULM@	8	02551	
1331	MODS	DCW	@4321@	4	02555	
1332		DCW	@7@	1	02556	
1333		DC	@6@	1	02557	
1334			@5@	1	02558	
1335			@4@	1	02559	
1336			@2@	1	02560	
1337			@1@	1	02561	
1338	CTLCCD		@ @	1	02562	
1339	LPRT	DC	@ @	1	02563	
1340	LPINST	DC	@ @	1	02564	
1341	ADDR02	DCW	ERRTAB	5	02569	01858
1342	ERR	DCW	@*ERROR@	6	02575	
1343	ACTION	DC	@REQ ERROR ACTION@,G	16	02576	
1344	ERCODE	DCW	@547P@	4	02596	
1345	SAVIND	DCW	@1 2 4 8 A B@,G	11	02597	
1346	STIND	DC	@1 2 4 8 A B@,G	11	02609	
1347	NOERSW	DC	@ @	2	02621	
1348						

ADDR OF ERR TABLE

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I/O DICOST ERROR CONTROL

CT ADDR INSTRUCTION

PGLIN LABEL

OPCCD OPERAND

1350 *** I/O DICOST PROGRAM ***
 1351 *** ERROR CONTROL ***
 1352 THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
 1353 ED ERRORS HAVE TO BE INDICATED, IF THERE ARE THIS ROUTINE BUILDS
 1354 THE ERROR MESSAGE AND HAS IF TYPED OUT. THIS ROUTINE ALSO CHECKS
 1355 TAD 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
 1356

LOCATE FAILING INST

1357	ERRCIL	MLCA	X2,X5	LOAD IND REG 5	12	02623	D	00034	00049	T
1358		S	21,X5		11	02635	S	09809	00049	S
1359		SCNLA	0EX5,0EX5	SCAN THE ROUTINE	12	02646	D	00+0	00+0	B
1360		SAR	X5	STORE CHAR ADDR	7	02658	G	00049	A	
1361		MLCS	1EX5,*E12	MOVE CHARACTER TO BE CHECKED	12	02665	D	00+1	02688	3
1362		BCE	GOTONE,CODES,	IS OP CODE M	12	02677	B	02721	02551	
1363		BCE		IS OP CODE L	1	02689	B			
1364		BCE	SHORT1	IS OP CODE U	6	02690	B	02740		
1365		C	X3,X5	HAS ROUTINE BEEN	11	02696	C	00039	00049	
1366		BL	LOCFLD	SEARCHED	7	02707	J	02764	T	
1367		B	ERRCTL&12	GO CONTINUE THE SRCH	7	02714	J	02635		
1368		MLCWA	10EX5,LOOP&9	LOAD THE LOOP INST	12	02721	D	00+0	01022	X
1369		B	LOCFLD		7	02733	J	02764		
1370		MLCWA	5EX5,LOOP&9	LOAD THE LOOP INST	12	02740	D	00+5	01022	X
1371		MLCS	2N2,LOOP	SET NO-OP FOR SHORT	12	02752	D	09804	01013	3
1372				INSTRUCTION						
1373		MLCA	LOC&9,234	MOVE FAILING OPER	12	02764	D	01022	00234	T
1374		MLNA	X3,223	MOVE ADDR OF ROUT	12	02776	D	00039	00223	/
1375		ZA	ADDR02,X1	LOAD ND REG 1	11	02788	M	02569	00029	
1376		ZA	2002092,X5	LOAD IND REG 5	11	02799	M	09814	00049	
1377				SCAN ERROR TABLE & UPDATA ERROR COUNT						
1378		SCNLA	0EX1,0EX1	SCAN THE ERROR TABLE	12	02810	D	000+0	000+0	S
1379		SAR	X1	STORE ADDR	7	02822	G	00029	A	D
1380		BCE	AFTSRH,16X1,L	HAS TABLE BEEN COMP.	12	02829	B	02888	000+1	L
1381		SH	X1-1	DEFINE ERROR	6	02841		00028		
1382		MLNWA	X1,0EX5	MOVE ERROR CODE NO.	12	02847	D	00029	00+0	V
1383		A	232,X5	UPDATE IND REG 5	11	02859	A	09815	00049	

PGLIN	LABEL	OPCCD	OPERAND	NINE TIMES	CI	ADDRS	INSTRUCTION
1386							
1387		CW	1&X1,X1-1	CLEAR WM S	11	02870	000+1 00028
1388		B	ERSCAN		7	02881	J 02810
1389				LOAD PRINT FIELD WITH ERROR MSG			
1390	AFTSRH	BCE	WHERE2,1000,1	BRCH IF BYPASSING ERRORS	12	02888	B 02150 01000 1
1391	ERROSH	NCP			1	02900	N
1392		BCE	WHERE2,209	BRCH IF NO ERRORS	12	02901	B 02150 00209
1393		SW	ERROSHW1	RESET ERROR SW	6	02913	, 02901
1394		MLCA	ERR,206	MOVE ERROR	12	02919	D 02575 00206 1
1395		MLCA	2&X3,ROUTID	MOVE ROUTINE IDENT	12	02931	D 000M2 02960 1
1396		B	TYPI	GO TYPE ROUTINE ID	7	02943	J 01593
1397		DCW	ROUTINE 2		8	02957	
1398	ROUTID	DC	2 2,G		3	02960	
1399		B	TYMES		7	02962	J 01517
1400				TYPE ADDITIONAL ERROR INFORMATION			
1401	EXTRA	NCPWM			1	02969	N
1402		WCP	DATA	PRINT EXTRA DATA	10	02970	M 2T0 01710 W
1403		BCB1	*-16		7	02980	R 02970 2
1404		BAL	*&1		7	02987	R 02994 M
1405		CW	EXTRA&1		6	02994	0 02970
1406	ACT	BCE	*&8,1001,1	LOOP ACTION REQUIRED	12	03000	B 03019 01001 1
1407		B	WHERE2		7	03012	J 02150
1408		SW	LUPINT&1	TURN ON SWITCH	6	03019	, 02483
1409		MRCWG	ACTION,201	MOVE ACTION MSG	12	03025	D 02576 00201 1
1410		B	TYMES		7	03037	J 01517
1411		B	PRGCTL		7	03044	J 02238

*** I/C DICOST PROGRAM ***

*** DETERMINE WHICH STATUS INDICATORS ARE ON ***

THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE "N, ON THE CHANNEL BEING USED. THE INDICATORS FOUND ON ARE STORED IN THE PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.

STACHK	SBR	X5	STORE ADDR IN IND 5
--------	-----	----	---------------------

S8R X2

SBR X2
BW 0EX2,LPR1

S 372,X5
REDUCE ADDR BY 7

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DA04

INSTRUCTION

I/O DICOST ERROR CONTROL

PGLIN	LABEL	OPCCO	OPERAND	CT	ADDRS	INSTRUCTION
1422		MLCS	0EX5, LOOP&10	12	03088	D 004#0 01023 3
1423		MRCWG	STIND, 237	12	03100	D 02609 00237 1
1424		MLCS	0EX5, NUOPCO	12	03112	D 004#0 03142 3
1425		B	CHALTR	7	03124	J 01045
1426		DCW	CNTERR	5	03135	03297
1427		DC	NOIROY	5	03140	03155
1428		DCW	a a	1	03141	
1429	NUOPCO	DC	a a	1	03142	
1430		DC	a a	1	03143	
1431		ZA	200237a, X5	11	03144	Q 09821 00049
1432	NOIROY	NCP		1	03155	N
1433		BKRI	CNTERR	7	03156	R 03297 1
1434		B	UPIX	7	03163	J 03328
1435	BUSY	NCP		1	03170	N
1436		BCBI	CNTERR	7	03171	R 03297 2
1437		B	UPIX	7	03178	J 03328
1438	DAIACK	NCP		1	03185	N
1439		BERI	CNTERR	7	03186	R 03297 4
1440		B	UPIX	7	03193	J 03328
1441	EXTEND	NCP		1	03200	N
1442		BEFI	CNTERR	7	03201	R 03297 8
1443		B	UPIX	7	03208	J 03328
1444	NOTENS	NCP		1	03215	N
1445		BNTI	CNTERR	7	03216	R 03297 8
1446		B	UPIX	7	03223	J 03328
1447	WLR	NCP		1	03230	N
1448		BWLI	CNTERR	7	03231	R 03297 -
1449		B	UPIX	7	03238	J 03328
1450		SW	NOIROY&1, BUSY&1	11	03245	, 03156 03171
1451		SW	DAIACK&1, EXTEND&1	11	03256	, 03186 03201
1452		SW	NOTRNS&1, WLR&1	11	03267	, 03216 03231
1453		MRCG	237, SAVIND	12	03278	D 00237 02597 5
1454		B	ERRCTL	7	03290	J 02623
1455	CNTERR	SBR	X6	7	03297	G 00054 R
1456		A	272, X6	11	03304	A 09816 00054
1457		CW	ERROSW&1	6	03315	D 02901

I/O DICOST ERROR CONTROL

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PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1458		B	UPIX&19	7	03321	J 03347
1459	UPIX	SHR	X6	7	03328	G 00054 B
1460		MLCS	@ 0,0EX5	12	03335	D 09808 004#0 3
1461		A	220,X5	11	03347	A 09822 00049
1462		B	0EX6	7	03358	J 004#0
1463						

STORE RETURN ADDR
REMOVE STATUS CHAR
UPDATE IND REG 5
RETURN TO PROGRAM

DA04 CT ADDR INSTRUCTION

I/O DICOST SEQUENCE CONTROL

OPCOD OPERAND

LABEL

PGLIN

1465	CILFED	EQU	201
1466		PST	

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15 1968

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DA04

INITIALIZE FOR DA04

OPCCD OPERAND

LABEL

PGLIN

CT ADDR INSTRUCTION

*** INITIALIZE COUNTERS, SWITCHES, AND INDEX REG ***

*** SELECT MODE ***

1468	START	CW	ONE3SWG1,THREE1C1	CLEAR	11	03365	D	05185	05280
1469		S	LNGCNT	RESET COUNTER	6	03376	S	09454	
1470		S	TENCNT	RESET COUNTER	6	03382	S	09341	
1471		ZA	20C002,X14	RESET IX 14	11	03388	M	09826	00094
1472		ZA	20C002,X15	RESET IX 15	11	03399	M	09826	00099
1473		BCE	*E8,1256,X	BRCH IF 7010	12	03410	B	03429	01256 X
1474		B	*E13		7	03422	J	03441	
1475		MLCA	2302,CON2		12	03429	D	09828	09491 I
1476		B	TYP2		7	03441	J	01607	
1477		DCW	2HA0,CE-HAO,WRT FMT ON,SEL MODE2,G		30	03477			
1478		DCW	2 2,G		1	03479			
1479		MLCS	*-13,SPTAD1	MOVE MODE CODE SEL	12	03481	D	03479	01005 3
1480		ZA	2N26,X3	LOAD IX 3	11	03493	M	09833	00039
1481		B	N26		7	03504	J	09136	

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CT ADDR\$ INSTRUCTION

PGLIN LABEL NOI OPCOD OPERAND

*** TEST ROUTINE DESCRIPTION ***

*** RESET 7631, TEST CONTROL TRIGGER & END CP ***

THIS TEST REQUESTS A MACHINE RESET TO RESET ALL LATCHES IN THE 7631. THEN IF PRIORITY IS AVAILABLE AN OVERLAPPED I/O NO-OP IS ISSUED, FOLLOWING A SHORT DELAY THE OVERLAP IN PROCESS IS TESTED. IF OVERLAP IN PROCESS IS ON IT INDICATES THAT THE 7631 HAS HUNG UP AND THE MACHINE IS RESET BY ISSUING AN ILLEGAL INSTRUCTION. IF THIS HAPPENS ERROR 01 IS INDICATED, INCLUDED IN THE ERROR MESSAGE WILL BE THE CONTENTS OF THE E REGISTER. SHOWING HOW MANY CHARACTER WERE TRANSFERRED BEFORE THE 7631 HUNG UP.

PGLIN	LABEL	NOI	OPCOD	OPERAND	CT	ADDR\$	INSTRUCTION
1485							
1486							
1487							
1488							
1489							
1490							
1491							
1492							
1493							
1494							
1495							
1496							
1497							
1498							
1499							
1500							
1501							
1502							
1503							
1504							
1505							
1506							
1507							
1508							
1509							
1510							
1511							
1512							
1513							
1514							
1515							
1516							
1517							
1518							
1519							
1520							

ROUTINE ID
MOVE RESET BRCH INST
TYP1
DCW 2COMP RESET,CHK 76312,G
H
WAIT FOR ACTION
RESTORE LOC 1
BRCH IF PRIORITY AVA
SET FILE ADDR
MOVE OVER LAP CODE
I/O NO-OP OVERLAPEN
WAIT FOR OVERLAP
TO DROP ON 7010
BRCH OVERLAP IN PROC
STORE ADDR REG
MOVE E REG MESSAGE
MOVE BRCH INST TO 1
RESTORE LOCATION 1
*** SET ERROR 01 ON ***

1 03511 N
2 03513
12 03514 D 09354 00001 L
7 03526 J 01593
19 03551
1 03553
12 03554 D 02015 00001 L
12 03566 B 03585 01264 1
7 03578 J 03720
12 03585 D 09837 09896 T
12 03597 D 09GRI 03610 3
10 03609 M 2FO 09891 V
11 03619 A 09809 09341
7 03630 J 03644 V
7 03637 J 03619
7 03644 J 03665 1
7 03651 R 03658 M
7 03658 J 03720
7 03665 G 01714 E
12 03672 D 09342 01728 L
12 03684 D 09362 00001 L
1 03696
12 03697 D 02015 00001 L

199-500

LINE	NO	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION	PAGE	DATE
1521	SW	E1,EXTRA&1	TURN ON ERROR IND	11	03709	, 01802 02970	176	APR 15 1958
1522	7631	HAS HUNG IF	ENLAP, POSSIBLE CAUSE, CONTROL TRIGGER OR END OP					
1523		FAILING. CHECK 2 REG CONTENTS FOR POSSIBLE CLUE.-E REG SETTING						
1524		TYPED IN ERROR MESSAGE-						
1525	NOEXIT	6	MONITOR	7	03720	J 02066		

195-~~2527~~

CT ADDR INSTRUCTION

N02 OPCOD OPERAND

LABEL

PGLIN

1527 *** TEST ROUTINE DESCRIPTION ***
1528 *** TEST ERROR CONDITICNS ON 7631 AFTER MACHINE RESET ***
1529
1530 THIS ROUTINE CHECKS FOR ANY STATUS INDICATORS TURNED ON BY THE
1531 I/O NO-OP ISSUED IN ROUTINE N01.-A SEEK OP IS USED IF PRIORITY IS
1532 NOT AVAILABLE-IF ANY INDICATORS ARE FOUND ON ERROR 02 IS
1533 INDICATED.
1534 N02 NCP
1535 DC 2022
1536 BA1 SETE2
1537 MRCG CEADDR,FILE
1538 SD 1,FILE
1539 BA1 *48
1540 B NO2X11
1541 *** SET ERROR 02 ON ***
1542 SETE2 SW E2
1543 STATUS INDICATOR TURNED ON BY 7631 AFTER A MACHINE RESET,POSSIBLE
1544 TROUBLES WITH ERROR LATCHES IN 7631-IF BUSY WAS ON IT IS POSSIBLE
1545 THAT THE 7631 TREATED THE I/O NO-OP IN ROUT 1 LIKE A NORMAL SEEK.
1546 NO2X11 B MONIIR

1 03727 N
2 03729 G
7 03730 R 03773 M
12 03737 D 09662 09891 \$
10 03749 M 2F0 09891 R
7 03759 R 03773 M
7 03766 J 03779
6 03773 , 01803
7 03779 J 02066

ROUTINE ID
BRCH IF ANY STATUS ERRORS
SET FILE ADDR
SEEK DISK
CHECK FOR ANY IND

196

NO3

OPCED OPERAND

PGLIN LABEL

1548 *** TEST ROUTINE DESCRIPTION ***
1549 *** TEST SERIAL REG AND PARITY TRIGGER ***
1550
1551 USING A SEEK OP ALL 64 CHARS ARE SHIPPED TO THE 7631 IN THE HA2
1552 PORTION OF THE FILE ADDRESS, ONE CHARACTER AT A TIME. WHEN EVER A
1553 DATA CHECK OCCURES THE CHARACTER BEING USED IS STORED AND THE
1554 ROUTINE CONTINUES UNTIL ALL 64 CHARACTERS HAVE BEEN TESTED. IF ANY
1555 ONE OR MORE CHARACTERS CAUSED A DATA CHECK ERROR 03 IS INDICATED
1556 AND THE FAILING CHARACTERS ARE TYPED OUT. IF MORE THAN ONE CHAR.
1557 FAILED, ANALYSIS OF THE BIT MAKE UP WILL AID IN LOCATING THE BUG.
1558 NO3 NCP
1559 DC 2032 ROUTINE ID
1560 MEGA ZERO, FILE 7 LOAD FILE ADDR
1561 ZA 200002, X10 LOAD IX 10
1562 ZA 200002, X11 LOAD IX 11
1563 SD 1, FILE SEEK ACC
1564 B#1 *61
1565 BER1 BADCHR BRCH ON DATA CHECK
1566 A 212, X10 UP DATE X10
1567 MLCS ALLCHR 2, X10, FILE 7 MOVE TEST CHAR
1568 MLCS ALLCHR 2, X10
1569 C X10, 26C2 HAVE ALL CHAR BEEN
1570 BE NO3XIT CHECKED
1571 B CHKCHR
1572 MLCS FILE 7, DATA 2, X11 MOVE FAILING CHAR
1573 *** SET ERROR 03 ON ***
1574 SW EXTRA 2, E3 TURN ON ERROR IND
1575 ONE OR MORE CHARACTERS CAUSED PARITY ERROR ON A SEEK OP. FAILING
1576 CHARACTERS APPEAR AS 3RD LINE OF ERROR MESSAGE.
1577 A 212, X11 UPDATE X 11
1578 B NEXCHR
1579 B NO3XIT MONITR

1	03786	N
2	03788	
12	03789	D 09375 09898 T
11	03801	Q 09826 00074
11	03812	Q 09826 00079
10	03823	M 2FO 09891 R
7	03833	R 03840 M
7	03840	R 03901 4
11	03847	A 09809 00074
12	03858	D 09LP6 09898 3
6	03870	D 09LP6
11	03876	C 00074 09839
7	03887	J 03942 S
7	03894	J 03823
12	03901	D 09898 01PA0 3
11	03913	, 02970 01804
11	03924	A 09809 00079
7	03935	J 03847
7	03942	J 02066

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CT ADDR INSTRUCTION

NO4

PCLIN LABEL OPERAND

1581 *** TEST ROUTINE DESCRIPTION ***
1582 *** TEST ACCESS AND MODULE DECODER ***
1583
1584 THE ACCESS AND MODULE ADDRESS IS SET TO 11 AND A SEEK OP IS
1585 ISSUED, NOT READY IS CHECKED. ERROR 4 WILL BE INDICATED IF THE
1586 NOT READY IS NOT ON. THE ADDRESS IS SET TO 00 AND ANOTHER SEEK IS
1587 ISSUED THIS TIME NOT READY SHOULD BE DOWN AND ERROR 05 IS GIVEN
1588 IF IT IS ~~ON~~ THE ACCESS ADDRESS IS NOW STEPPED FROM 1 TO 9 WITH A
1589 SEEK AND CHECK FOR NOT READY ON EACH COUNT. IF NOT READY IS OFF
1590 THE TEST IS TERMINATED AND ERROR 06 IS GIVEN, THIS LEAVES THE
1591 FAILING ACCESS ADDRESS STILL AVAILABLE IN THE FILE ADDRESS. IF THE
1592 ACCESS TEST IS SUCCESSFUL THE MODULE ADDRESS IS STEPPED FROM 1-9
1593 AND A SEEK OP WITH CHECK FOR NOT READY IS ISSUED EACH TIME. IF THE
1594 NOT READY IS EVER OFF ERROR 07 IS INDICATED AND THE TEST IS TERM-
1595 INATED, LEAVING THE FAILING MODULE ADDRESS IN THE FILE ADDRESS. IT
1596 IS IMPORTANT THAT ALL MODULES HAVE BEEN SET INOPERATIVE EXCEPT
1597 MODULE 0 IN ORDER FOR THIS TEST TO BE VALID.

NO4	NO4	ROUTINE ID	CT	ADDR	INSTRUCTION
1599	NO4		1	03949	N
1600	DC	2042	2	03951	
1601	MLCA	29#202, FILE 5	12	03952	D 09843 09896 T
1602	MLCA	2112	6	03964	D 09845
1603	SB	1, FILE	10	03970	M 2FO 09891 R
1604	BAL	*E1	7	03980	R 03987 M
1605	BUR1	*E7	7	03987	R 04000 I
1606	***	SET ERROR 04 ON ***	6	03994	01805
1607	SW	E4			
1608		ACCESS & MODULE ADDRESS OF 11 DID NOT BRING UP NOT READY ON A SEEK			
1609		OP. POSSIBLE CAUSE-ACCESS INOP LATCH OR NOT READY LATCH FROZEN OFF			
1610	MLCA	2002, FILE 1	12	04000	D 09847 09892 T
1611	SB	1, FILE	10	04012	M 2FO 09891 R
1612	BAL	*E1	7	04022	R 04029 M
1613	BUR1	*E8	7	04029	R 04043 I
1614	B	*E7	7	04036	J 04049
1615	***	SET ERROR 05 ON ***	6	04043	01806
1616	SW	E5			

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NG4

PGCLIN LABEL OPCCD OPERAND

CT ADDR INSTRUCTION

1617 AFTER SETTING NOT READY ON, A SEEK OP WITH ACCESS MODULE SET TO 00
1618 DOES NOT RESET THE NOT READY. POSSIBLE CAUSE ACCESS INOP LATCH
1619 CANNOT BE RESET.

1620 NEXACC A 212, FILE ADD 1 ACCESS ADDR

1621 BZ NEXMOD-6

1622 SC 1, FILE SEEK DISK

1623 BAI *E1

1624 BNRI NEXACC BRCH NOT READY

1625 *** SET ERROR 06 ON ***

1626 SH E6 SET ERROR IND ON

1627 AN ACCESS ADDRESS 1-9 DID NOT TURN ON NOT READY ON A SEEK OP. THE
1628 FAILING ADDRESS MAY BE SEEN BY DISPLAYING THE FILE ADDRESS.
1629 POSSIBLE CAUSE ACCESS DECODER FAILING.

1630 8 NO4XIT

1631 SH FILEG1

1632 NEXMOD A 212, FILEG1 ADD 1 TO MOD ADDR

1633 BZ NO4XIT

1634 SD 1, FILE SEEK ACCESS

1635 BAI *E1

1636 BNRI NEXMOD BRCH NOT READY

1637 *** SET ERROR 07 ON ***

1638 SH E7 SET ERROR IND ON

1639 A MODULE ADDRESS 1-9 DID NOT TURN ON NOT READY ON A SEEK OP. THE
1640 FAILING ADDRESS MAY BE SEEN BY DISPLAYING THE FILE ADDRESS.
1641 POSSIBLE CAUSE MODULE DECODER FAILING.

1642 NO4XIT 8 MONITR

11 04049 A 09809 09891

7 04060 J 04104 V

10 04067 M 2F0 09891 R

7 04077 R 04084 M

7 04084 R 04049 I

6 04091 , 01807

7 04097 J 04158

6 04104 , 09892

11 04110 A 09809 09892

7 04121 J 04158 V

10 04128 M 2F0 09891 R

7 04138 R 04145 M

7 04145 R 04110 I

6 04152 , 01808

7 04158 J 02066

199-000

CT ADDRS INSTRUCTION

NOS

PCLIN LABEL OPCCD OPERAND

1644 *** TEST ROUTINE DESCRIPTION ***
1645 *** TEST 7631 OP CODE DECODER ***
1646
1647 THIS ROUTINE TESTS THE OP CODE DECODERS ABILITY TO DECODE
1648 PROPERLY 7 OF THE 11 SPECIFIC OPERATIONS POSSIBLE. THE CODES TEST-
1649 ED ARE DONE IN A NO-OP MODE SO THAT NO OPERATIONS ARE PERFORMED,
1650 BECAUSED PRIORITY IS REQUIRED FOR THE NO-OP THIS TEST IS NOT RUN
1651 IF PRIORITY IS NOT AVAILABLE. THE ERRORS INDICATED WHEN INVALID
1652 COMMAND IS SENSED ARE.

1653 SEEK OP CODE 0 ERROR 07
1654 SRO OP CODE 1 ERROR 08
1655 TRO OP CODE 2 ERROR 09
1656 WDC OP CODE 3 ERROR 10
1657 HAO OP CODE 5 ERROR 11
1658 TWA OP CODE 6 ERROR 12
1659 WFT OP CODE 7 ERROR 13

1660 THE REMAINING OP CODES ARE OPTIONAL FEATURES AND ONE SETS THE
1661 ACCESS INOP. THEY MAY BE TESTED LATER IN THE PROGRAM.

1662	NOS	NCP		1	04165	N
1663		DC	2050	2	04167	
1664		MRCC	CEADDR, FILE	12	04168	D 09662 09891
1665		SD	1, FILE	10	04180	M 2F0 09891 R
1666		BAI	*E1	7	04190	R 04197 M
1667		BEF1	*E8	7	04197	R 04211 8
1668		B	*E7	7	04204	J 04217

*** SET ERROR 07 ON ***

SW E7 SET ERROR IND ON

1671 A SEEK OP CAUSES EXT. COND-INVALID COMMAND- CHECK CP DECODER

1672	BCE	N05XIT, 1264,	BRCH IF PRI NOT AVL	12	04217	B 04451 01264
1673	MU	2F1, FILE, Q	SRO OP	10	04229	M 2F1 09891 Q
1674	BAI	*E1		7	04239	R 04246 M
1675	BEF1	*E8	CHECK INVALID CODE	7	04246	R 04260 8
1676	B	*E7		7	04253	J 04266

*** SET ERROR 08 ON ***

SW E8 TURN ON ERROR IND

1678 A SINGLE RECORD OP CAUSES EXT COND-INVALID COMMAND- CHECK OP DECDR

6 04260 , 01809

200023

DA04

INSTRUCTION

CT ADDR

NC5

OPCCD OPERAND

TR0 OP

WDC OP

HA0 OP

THA OP

PGLIN LABEL

1680 MU %F2,FILE,Q

1681 BAI *E1

1682 BEF1 *E8

1683 B *E7

1684 *** SET ERROR 09 ON ***

1685 SW E9

1686 A TRACK WITHOUT ADDRESSES OP CAUSES EXT COND-INVALID COMMAND-

1687 CHECK OP DECODER

1688 MU %F3,FILE,V

1689 BAI *E1

1690 BEF1 *E8

1691 B *E7

1692 *** SET ERROR 10 ON ***

1693 SW E10

1694 A WDC OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECODER

1695 MU %F5,FILE,Q

1696 BAI *E1

1697 BEF1 *E8

1698 B *E7

1699 *** SET ERROR 11 ON ***

1700 SW E11

1701 A HOME ADDRESS OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECDR

1702 MU %F6,FILE,Q

1703 BAI *E1

1704 BEF1 *E8

1705 B *E7

1706 *** SET ERROR 12 ON ***

1707 SW E12

1708 A TRACK WITH ADDRESS OP CAUSES EXT COND-INVALID COMMAND-CHECK

1709 OP DECODER

1710 MU %F7,FILE,Q

1711 BAI *E1

1712 BEF1 *E8

1713 B *E7

1714 *** SET ERROR 13 ON ***

1715 SW E13

10

04266

M

%F2

09891

Q

7

04276

R

04283

M

7

04283

R

04297

B

7

04290

J

04303

6

04297

,

01810

10

04303

M

%F3

09891

V

7

04313

R

04320

M

7

04320

R

04334

B

7

04327

J

04340

6

04334

,

01811

10

04340

M

%F5

09891

Q

7

04350

R

04357

M

7

04357

R

04371

B

7

04364

J

04377

6

04371

,

01812

10

04377

M

%F6

09891

Q

7

04387

R

04394

M

7

04394

R

04408

B

7

04401

J

04414

6

04408

,

01813

10

04414

M

%F7

09891

Q

7

04424

R

04431

M

7

04431

R

04445

B

7

04438

J

04451

6

04445

,

01814

201

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DA04

CT

ADDRS INSTRUCTION

N05

OPCOD OPERAND

LABEL

PGLIN

1716 A WRITE FORMAT OP CAUSES EXT CCND-INVALID COMMAND-CHECK OP DECDR

1717 N05XIT 8 MONITR

7 04451 J 02066

202

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DAO4

CT ADDR INSTRUCTION

NO6

OPCOD OPERAND

PGLIN LABEL

```

1719
1720
1721 *** TEST HI ORDER POSITIONS OF TRACK REGISTER ***
1722 *** ACCESS POSITIONED AT CYLINDER 000 ***
1723 THIS TEST IS RUN ONLY WHEN MANUAL MODE HAS BEEN SELECTED. THE
1724 ACCESS IS FIRST POSITIONED MANUALLY TO CYL 000 BY THE CE, THEN A
1725 SEEK IS ISSUED TO EACH TRACK POSITION IN CYL 000. EACH SEEK IS
1726 FOLLOWED BY A SEEK TO THE SAME ADDRESS AND BUSY IS CHECKED. IF
1727 BUSY COMES ON THE ACCESS HAS MOVED INDICATING THE TRACK REGISTER
1728 IMPROPERLY DECODED THE ADDRESS. IF THIS HAPPENS ERROR 14 IS IND-
1729 ICATED AND THE FAILING ADDRESS IS STILL PRESENT AT THIS TIME.
1730 NO6 NCP
1731 DC 2062 ROUTINE ID
1732 BCE *C8,SPTAD1,1 BRCH IF IN MANUAL
1733 B N08XIT
1734 B TYP1
1735 DCW 2ACC TO CYL 0002,G
1736 H WAIT FOR ACTION
1737 MLCA 200002,FILE55 LOAD FILE ADDR
1738 MLCA 2002
1739 CYL000 SD 1,FILE SEEK ACCESS
1740 BAI *C1
1741 SC 1,FILE SEEK ACCESS AGAIN
1742 BAI *C1
1743 BCB1 ZEROCK CHECK FOR BUSY
1744 NEXTRK A 212,FILE55 UPDATE TRACK ADDR
1745 BCE N06XIT,FILE54,4 CYLINDER COMPLETE
1746 B CYL000
1747 *** SET ERROR 14 ON ***
1748 ZEROCK SW E14 SET ERROR IND ON
1749 A SEEK TO ONE OF THE TRACKS IN CYL 000 CAUSED ACCESS TO MOVE.
1750 BAI STACHK BRCH TO STATUS CHK
1751 B NEXTRK RETURN HERE
1752 N06XIT B MONITR

```

```

1 04458 N
2 04460
12 04461 B 04480 01005 I
7 04473 J 04896
7 04480 J 01593
14 04500
1 04502 .
12 04503 D 09826 09896 T
6 04515 D 09847
10 04521 M 2FO 09891 R
7 04531 R 04538 M
10 04538 M 2FO 09891 R
7 04548 R 04555 M
7 04555 R 04592 2
11 04562 A 09809 09896
12 04573 B 04612 09895 4
7 04585 J 04521
6 04592 , 01815
7 04598 R 03051 M
7 04605 J 04562
7 04612 J 02066

```


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N07

CT ADDR INSTRUCTION

PGLIN LABEL OPCODE OPERAND

```
1754
1755 *** TEST ROUTINE DESCRIPTION ***
1756 *** TEST HI ORDER POSITION OF TRACK REGISTER ***
1757 THIS IS THE SAME AS ROUTINE NC6
1758 THIS IS THE SAME AS ROUTINE N06 EXCEPT THAT THE ACCESS IS
1759 POSITIONED AT CYLINDER 110 AND SEEKS ARE ISSUED FOR EACH TRACK
1760 IN THE CYLINDER. IF THE ACCESS MOVES ERROR 15 IS INDICATED. FOR
1761 MORE DETAIL REFER TO ROUTINE N06.
1762
1763 NCP
1764 ROUTINE ID
1765 DC 2072
1766 B TYP1
1767 DCW 2ACC TO CYL 1102,G
1768 H WAIT FOR ACTION
1769 MLCA 244002,FILE25 LOAD FILE
1770 MLCA 2002 ADDRESS
1771 SD 1,FILE SEEK ACCESS
1772 BAI *21
1773 SD 1,FILE SEEK ACCESS AGAIN
1774 BAI *21
1775 BC81 ONETEN BRCH BUSY
1776 A 212,FILE25 ADD 1 TO TKHD ADDR
1777 BCE N07XIT,FILE24,4 BRCH IF CYL COMP
1778 B CYL110
1779 *** SET ERROR 15 ON ***
1780 ONETEN SW E15 SET ERROR IND ON
1781 A SEEK TO ONE OF THE TRACKS IN CYL 110 CAUSED ACCESS TO MOVE
1782 BAI STACHK GO TO ERROR ROUTINE
1783 B UP1TRK RETURN HERE
1784 B MONITR
1785 N07XIT B
```

1	04619	N
2	04621	
7	04622	J 01593
14	04642	
1	04644	.
12	04645	D 09837 09896 T
6	04657	D 09847
10	04663	M 2FO 09891 R
7	04673	R 04680 M
10	04680	M 2FO 09891 R
7	04690	R 04697 M
7	04697	R 04734 2
11	04704	A 09809 09896
12	04715	B 04754 09895 A
7	04727	J 04663
6	04734	, 01816
7	04740	R 03051 M
7	04747	J 04704
7	04754	J 02066

204

CT ADDR INSTRUCTION

PGLIN	LABEL	NOB	OPCD	OPERAND	CT	ADDR	INSTRUCTION
1785			***	TEST ROUTINE DESCRIPTION ***			
1786			***	TEST HI ORDER POSITION OF TRACK REGISTER ***			
1787			***	ACCESS POSITIONED AT CYL 194 ***			
1788							
1789				THIS IS THE SAME AS ROUTINE NO6 & NO7 EXCEPT THAT THE ACCESS IS			
1790				POSITIONED AT CYLINDER 194.ERRORR 16 IS INDICATED IF THE ACCESS			
1791				MOVES.REFER TO ROUTINE NO6 DESCRIPTION FOR MORE DETAIL.			
1792	N08	NCP			1	04761	N
1793		DC	2082	ROUTINE ID	2	04763	
1794		B	1YPI		7	04764	J 01593
1795		DCH	2ACC TO CYL 1942.G		14	04784	
1796		H		WAIT FOR ACTION	1	04786	.
1797		MLCA	277602,FILE35	LOAD FILE	12	04787	D 09851 09896 T
1798		MLCA	2002	ADDRESS	6	04799	D 09847
1799	CYL194	SO	1,FILE	SEEK ACCESS	10	04805	M 2FO 09891 R
1800		BAL	*C1		7	04815	R 04822 M
1801		SO	1,FILE	SEEK ACCESS AGAIN	10	04822	M 2FO 09891 R
1802		BAL	*C1		7	04832	R 04839 M
1803		BCBI	ONE94	BRCH BUSY	7	04839	R 04876 2
1804	TRKUP1	A	212,FILE35	UPDATE TRACK ADDR	11	04846	A 09809 09896
1805		BCE	N08XIT,FILE44.0	BRCH IF CYL COMPLETE	12	04857	B 04896 09895 0
1806		B	CYL194		7	04869	J 04805
1807		***	SET ERROR 16 ON ***				
1808	ONE94	SW	E16	SET ERROR IND ON	6	04876	. 01817
1809				A SEEK TO ONE OF THE TRACKS IN CYL 194 CAUSED ACCESS TO MOVE			
1810		BAL	STACHK	GO TO ERROR ROUTINE	7	04882	R 03051 M
1811		B	TRKUP1	RETURN HERE	7	04889	J 04846
1812	N08XIT	B	MONITR		7	04896	J 02066

PGLIN	LABEL	OPCODE	OPERAND	NO9	CT	ADDRS	INSTRUCTION
1850		B	PASS9		7	05055	J 05143
1851		BCE	*E8,LNGCNT-3,2		12	05062	B 05081 09451 2
1852		B	DELAY2		7	05074	J 05030
1853		SER	DATA64		7	05081	G 01714 E
1854		***	SET ERROR 18 CN ***				
1855		SW	E18,EXTRA61		11	05088	, 01819 02970
1856			A WRITE FORMAT OPERATION CAUSES 7631 TO HANG UP, THE CONTENTS OF				
1857			THE E REG AFTER THE WRITE FORMAT ARE DISPLAYED IN THE FRROR MESS-				
1858			AGE. IF THE E REG SETTING INDICATES ONLY THE ADDRESS WAS TRANS-				
1859			FERRED, POSSIBLE FAILURE OF PREP READ-WRITE OR WRITE LINE. IF THE				
1860			E REG SETTING INDICATES SOME PART OF THE DATA FIELD WAS TRANS-				
1861			FERRED, POSSIBLE FAILURE IN THE REVOLUTION COUNTER.				
1862		MRCWG	EREG, DATA6M		12	05099	D 09342 01G/0 L
1863		MRCWG	BRCH2, 1		12	05111	D 09455 0000L L
1864		DCW	2M6		1	05123	
1865	HANG2	MRCWG	RESUME, 1		12	05124	D 02015 0000L L
1866		B	N09XIT		7	05136	J 05168
1867	PASS9	A	216, TENCNT		11	05143	A 09809 09341
1868		BZ	N09XIT		7	05154	J 05168 V
1869		B	TS19		7	05161	J 04984
1870	N09XIT	B	MONITR		7	05168	J 02066

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PGLIN	LABEL	NIO	OPCD	OPRAND	CT	ADDRS	INSTRUCTION
1908		BA1	*E1		7	05240	R 05247 M
1909		BEF1	CHKWLR		7	05247	R 05323 8
1910		BER1	SETE19		7	05254	R 05407 4
1911		A	212, IENCNT		11	05261	A 09809 09341
1912		BZ	NIOXIT		7	05272	J 05413 V
1913	THREE1	NCPWM			1	05279	N
1914		B	*E19		7	05280	J 05305
1915		SW	THREE1E1, ONE3SWE1	TURN ON SWITCHES FOR	11	05287	, 05280 05185
1916		B	ONE3SW	6 BIT MODE FORMAT	7	05298	J 05184
1917		CM	THREE1E1, ONE3SWE1	TURN OFF SWITCHES	11	05305	0 05280 05185
1918		B	ONE3SW		7	05316	J 05184
1919	CHKWLR	BWL1	CHKNOT	CHECK WRONG L IN	7	05323	R 05374 -
1920		C	DATAE4, CON1	WAS DATA TRANSFERRED	11	05330	C 01714 09467
1921		BE	*E14	IF SO	7	05341	J 05361 S
1922		***	SET ERROR 20 ON ***		6	05348	, 01821
1923		SW	E2C	SET ERROR IND CN			
1924				WRITE FORMAT CAUSES EXT COND AND NOT ALL THE DATA IS TRANSFERRED,			
1925				POSSIBLE FAILURE IN PHASE SELECT CKTS ASSOCIATED WITH WRITE.			
1926		B	NIOXIT		7	05354	J 05413
1927		***	SET ERROR 21 ON ***		6	05361	, 01822
1928		SW	E21	SET ERROR IND ON			
1929				WRITE FORMAT CAUSES EXT COND WITH ALL DATA BEING TRANSFERRED			
1930				POSSIBLE CAUSE, DISCONNECT NOT RECOGNIZED.			
1931		B	NIOXIT		7	05367	J 05413 S
1932	CHKNOT	BNT1	*E14	CHECK NC TRANSFER	7	05374	R 05394 B
1933		***	SET ERROR 22 ON ***		6	05381	, 01823
1934		SW	E22	SET ERROR IND ON			
1935				WRITE FORMAT CAUSES EXT COND, EWL, ALL DATA WAS TRANSFERRED,			
1936				POSSIBLE 1301 CKT CHECK			
1937		B	NIOXIT		7	05387	J 05413
1938		***	SET ERROR 23 ON ***		6	05394	, 01824
1939		SW	E23	SET ERROR IND ON			
1940				WRITE FORMAT CAUSES EXT COND, WLR, & NO TRANSFER, POSSIBLE FAILURE			
1941				OF CE-HAD SWITCH ON OR THE ASSOCIATED CKTS.			
1942		B	NIOXIT		7	05400	J 05413
1943		***	SET ERROR 19 ON ***				

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PGLIN	N10	LABEL	OPCCD	OPERAND	CT	ADDRS	INSTRUCTION
1944		SETI19	SW	E19	6	05407	01820
1945		WRITE FORMAT CAUSES DATA CHECK, POSSIBLE FAILURE OF FORMAT					
1946		CHARACTER DECODER.					
1947		N10X11	B	MONI1R	7	05413	J 02066

111

LABEL	OPCCD	OPERAND
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CT ADDR INSTRUCTION

1949	*** TEST ROUTINE DESCRIPTION ***
1950	*** TEST WRITE DISK OPERATION ***
1951	THIS CHECKS THE OPERATION OF GAP DETECTORS,WRITE FORMAT CKTS, PHASE SELECTION ASSOCIATED WITH READ,AND DECODING AND OPERATING A WRITE DISK CHECK.USING THE FERMAT WRITTEN IN ROUTINE N10 AN OVERLAPPED WDC IS ISSUED AND IF OVERLAP DCES NOT DROP AFTER A GIVEN PERIOD OF TIME ERROR 25 IS INDICATED.FOLLOWING THIS A NON- OVERLAPPED WDC IS ISSUED AND EXT COND AND WLR ARE CHECKED.EXT COND CAUSES ERROR 26,EXT COND AND WLR CAUSES ERROR 26.TEN PASSES ARE MADE PROVIDED NO ERRORS OCCURE,AN ERROR CAUSES THE TEST TO TERMINATE.THE OVERLAP PORTION IS BYPASSED IF OVERLAP IS NOT AVAILABLE.
1952	
1953	
1954	
1955	
1956	
1957	
1958	
1959	
1960	
1961	

FORMAT ORGANIZATION
GAP1--M01 33 CHARS--GAP3

DATA FIELD USED

444

Year	Event	Location	Category	Code	Message	Count	Delay
1969	NCP						
1970	DC	2112	ROUTINE ID				
1971	S	LNGCNT					
1972	BCE	*E8,1264,1	BRCH IF OVERLAP AVAL				
1973	B	WDCNOV					
1974	MLCS	OVRLAP&X14,*E2	MOVE OVER LAP CCDE				
1975	MU	2F3,FILE,W	OVERLAPPED WDC				
1976	A	212,LNGCNT	ADD 1 TC DELAY COUNT				
1977	BCL1	*E15					
1978	BAL	STACHK	GO TO STATUS CHECK				
1979	B	WDCNOV					
1980	BCE	*E8,LNGCNT-3,2	IS DELAY COMPLETE				
1981	B	DELAY3					
1982	SER	DATA&4	STORE E REG				
1983	MU	MSG,DATA&7	MOVE MESSAGE				

DA04 CT ADDR INSTRUCTION

PGLIN	LABEL	OPCCD	OPERAND
		NII	

III

1985
*** SET ERROR 25 ON ***

1986 SW E25, EXTRA 1 SET ERROR IND ON

1987
WRITE DISK CHECK CAUSES 763I TC HANG UP,CPU STAYS IN OVERLAP.

8861 1988 DCW 202 202

1984 HANG3 MRCWG RESUME, I. RESTORE LOC 1

1990 B N11X1T

1991 WDCNCV WDC 1, FILE WDC NON-OVERLAP

1992 BAL 031

1993
BEE1 HLKCHK
CHECK FOR EXT CCND

1994 A 212.TENCNT ADD 1 TO PASS COUNT

1995
82
NIXIT
BRCH ON ZERO RESULT

1996

1997 WLRCHK BWLI *614 CHECK WLR

199# SET ERROR 26 ON

10000 SW F26 SET ERROR IND ON

WRITE' DISK CHECK CAUSES EXT COND. POSSIBLE FAILURE OF GAP DETECTOR

2001 B N11XIT

2002 *** SET ERROR 27 ON ***

2003 SW F27 SET ERROR IND ON

2004 WRITE DISK CHECK CAUSES EXT COND AND WLR, POSSIBLE FAILURE OF

2005 WRITE FORMAT CKTS. OR PHASE SELECT CKTS ASSOCIATED WITH READ.

2006 N11XII 8 MONTR

7 05658 J 02066

11 05552 , 01826 02970

I 05563

12 05564 D 02015 00001

7 05576 J 05658

10 05583 M XF3 09891 W

7 05593 R 05600

7 05600 R 05632 8

11 05607 A 09809 09341

7 05618 J 05658 V

7 05625 J 05420

7 05632 R 05652 -

6 05639 , 01827

7 05645 J 05658

6 05652 , 01828

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PGLIN	LABEL	N12 OPCDD	OPERAND	CT	ADDRS	INSTRUCTION
2044		B	N12XIT	7	05763	J 05836
2045	CHKLOC	C	DATA&4,CON2	11	05770	C 01714 09491
2046		BE	GETCHR	7	05781	J 05806 S
2047		***	SET ERROR 29 ON ***			
2048		SW	E29,EXTRA&1	11	05788	, 01830 02970
2049			WRITE FORMAT USING AN ILLEGAL CHARACTER IN DATA FIELD, THE WRONG			
2050			CHARACTER CAUSES DATA CHECK. B REG CONTENTS EQUALS 2 CHARACTERS			
2051			ABOVE ONE THAT CAUSED DATA CHECK. POSSIBLE FAILURE OF FORMAT CHAR			
2052			DECODER, DECODING LEGAL CHARACTER AS ILLEGAL.			
2053		B	N12XIT	7	05799	J 05836
2054	GETCHR	A	212,X10	11	05806	A 09809 00074
2055		BCE	N12XIT,X10-1,5	12	05817	B 05836 00073 5
2056		B	SETBAD	7	05829	J 05697
2057	N12XIT	B	MONITR	7	05836	J 02066

UP DATE IX 10
HAVE ALL ILLEGAL
CHARS BEEN CHKD

215-578

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N13

CT ADDR INSTRUCTION

PGLIN LABEL OPCOD OPERAND

```
2095 NOT CAUSE EXT COND, POSSIBLE FAILURE OF GAP DETECTOR
2096 MLCA 2112, DATAFD242 SHORTEN LONG GAP
2097 WDC 1, FILE WRITE DISK CHECK
2098 BAI *21 CHECK EXT COND
2099 BEFI *27
2100 *** SET ERROR 31 ON ***
2101 SW E31 SET ERROR IND ON
2102 WRITE DISK CHECK OF FORMAT WITH X GAP SHORTENED BY 1 CHAR DOES
2103 NOT TURN ON EXT COND, POSSIBLE FAILURE OF GAP DETECTOR
2104 MLCA 2212, DATAFD242 RESTORE LONG GAP
2105 MLCA 2222, DATAFD242 LENGTHEN SHORT GAP
2106 WDC 1, FILE WRITE DISK CHECK
2107 BAI *21
2108 BEFI *27 CHECK FOR EXT COND
2109 *** SET ERROR 32 ON ***
2110 SW E32 SET ERROR IND ON
2111 WRITE DISK CHECK OF FORMAT WITH GAP2 INCREASED BY 1 CHAR DOES NOT
2112 CAUSE EXT COND, POSSIBLE FAILURE OF GAP DETECTORS
2113 MLCA 2112, DATAFD242 SHORTEN SHORT GAP
2114 WDC 1, FILE WRITE DISK CHECK
2115 BAI *21
2116 BEFI *27 CHECK EXT COND
2117 *** SET ERROR 33 ON ***
2118 SW E33 SET ERROR IND ON
2119 WRITE DISK CHECK OF FORMAT WITH GAP2 SHORTENED BY 1 CHAR DOES NOT
2120 CAUSE EXT COND, POSSIBLE FAILURE OF GAP DETECTORS
2121 MLCA 242, DATAFD23 RESTORE SHORT GAP
2122 WDC 1, FILE WRITE DISK CHECK
2123 BAI STACHK GO CHECK STATUS IND
2124 A 212, TENCNT RETURN HERE
2125 B2 N13XIT TEN PASSES AND BRCH
2126 B TST13
2127 N13XIT B MONITR
```

CT	ADDR	INSTRUCTION
12	05929	D 09845 09942 T
10	05941	M 2F3 09891 M
7	05951	R 05959 M
7	05958	R 05971 8
6	05965	, 01832
12	05971	D 09853 09942 T
12	05983	D 09855 09924 T
10	05995	M 2F3 09891 M
7	06005	R 06012 M
7	06012	R 06025 8
6	06019	, 01833
12	06025	D 09845 09924 T
10	06037	M 2F3 09891 M
7	06047	R 06054 M
7	06054	R 06067 8
6	06061	, 01834
12	06067	D 09856 09923 T
10	06079	M 2F3 09891 M
7	06089	R 03051 M
11	06096	R 09809 09341
7	06107	J 06121 V
7	06114	J 05852
7	06121	J 02066

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CT ADDR INSTRUCTION

N14

PGLIN LABEL OPCOD OPERAND

2129 *** TEST ROUTINE DESCRIPTION ***
2130 *** TEST HAO OPERATION ***
2131
2132 THE PROGRAM PERFORMS AN OVERLAPPED WRITE HAO OPERATION AND THEN
2133 DELAYS LONG ENOUGH FOR THE OPERATION TO BE COMPLETED. AT THE END
2134 OF THE DELAY IF OVERLAP IS STILL IN PROCESS ERROR 35 IS INDICATED
2135 THE CONTENTS OF THE E REG AFTER THE WRITE HAO IS ALSO DISPLAYED
2136 WITH THE ERROR MESSAGE. TEN PASS ARE MADE IF NO ERRORS OCCURE.

2137
2138 FORMAT REQUIRED
2139 SAME AS FORMAT WRITTEN BY ROUTINE N13

2140
2141 DATA FIELD ORGANIZATION
2142 HAI 5 CHARS--HAZ 2 CHARS--REC ADDR 6 CHARS--RECORD 2 CHARS

2143
2144 DATA FIELD ORGANIZATION
2145 9#20388123456+

2147	N14	NCP					1	06128	N
2148		DC	2142		ROUTINE ID		2	06130	
2149		BCE	*E8,1263,1		BRCH IF OVERLAP		12	06131	8 06150 01263 1
2150		B	N14XIT				7	06143	J 06382
2151		CS	DATAF0E99		CLEAR WRITE FLD		6	06150	/ 09999
2152		MRCG	CEADDR,FILE		LOAD FILE ADDR		12	06156	D 09662 09891
2153		SW	FILEE2				6	06168	, 09893
2154		MLCA	FILEE5,DATAF0E3		LOAD		12	06174	D 09896 09903 1
2155		MLCA	28882,DATAF0E6		DATA		12	06186	D 09859 09906 1
2156		MRCWG	ALLBIT,DATAF0E7		FIELD		12	06198	D 09640 09907 1
2157		S	TENCNT				6	06210	S 09341
2158		MLCS	OVRAP&X14,*E2		MOVE OVER LAP CODE		12	06216	D 09GR1 06229 3
2159	IST14	MU	2F5,FILE,W		WRITE HAO OVERLAP		10	06228	M 2F5 09891 W
2160		S	LNGCNT				6	06238	S 09454
2161	DELAY4	A	212,LNGCNT		ADD 1 TO DELAY CNT		11	06244	A 09809 09454
2162		BCL1	*E15		BRCH OVERLAP IN PRO		7	06255	J 06276 1
2163		BA1	STACHK		GO TO STATUS CHECK		7	06262	R 03051 M
2...		"	04SS14				7	06269	J 06351

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PGLIN	LABEL	N14 OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
2165		BCE	*E8,LNGCNT-3,2	12	06276	B 06295 09451 2
2166		B	DELAY4	7	06288	J 06244
2167		***	SET ERROR 35 ON ***			
2168		SW	E35,EXTRA&1	11	06295	, 01836 02970
2169			WRITE HAC OVERLAPPED CAUSES 7631 TO HANG UP			
2170		SER	DATA&4	7	06306	G 01714 E
2171		MRCWG	EREG,DATA&7	12	06313	D 09342 01717 L
2172		MRCWG	BRCH4,1	12	06325	D 09649 00001 L
2173		OCW	2M2	1	06337	D
2174	HANG4	MRCWG	RESUME,1	12	06338	D 02015 00001 L
2175		B	N14XIT	7	06350	J 06382
2176	PASS14	A	212,TENCNT	11	06357	A 09809 09341
2177		BZ	N14XIT	7	06368	J 06382 V
2178		B	TST14	7	06375	J 06228
2179	N14XIT	B	MONITR	7	06382	J 02066

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637 151003

N15

DA04

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CT ADDRS INSTRUCTION

LABEL OPCCD OPERAND

PGLIN

2181 *** TEST ROUTINE DESCRIPTION ***
2182 *** TEST DATA HANDLING CAPABILITIES ***
2183
2184 THIS ROUTINE USES THE HAO OPERATION TO WRITE AND READ EVERY
2185 ONE OF THE 64 POSSIBLE CHARACTERS. SINCE THE CE-HAO SWITCH IS ON
2186 AT THIS TIME THE HOME ADDRESSES FOR 9#20-9#59 ARE ALSO WRITTEN.
2187 THE RECORD OF 2 CHARACTERS IS LOADED WITH ONE OF THE 64 1410
2188 CHARACTERS AND A WRITE HAO OP IS PERFORMED FOR EVERY 1PACK IN
2189 CYLINDER 253. IF THE ENTIRE DATA FIELD IS NOT TRANSFERRED ON THE
2190 WRITE OP ERROR 36 IS INDICATED. AFTER EVERY TRACK HAS BEEN WRITTEN
2191 ON P READ HAO OF EVERY TRACK IS PERFORMED. EVERY READ IS FOLLOWED
2192 BY A CHECK OF EXT. COND. DATA CHECK, AND COMPARE IN MEMORY OF THE
2193 DATA FIELD READ TO THAT WRITTEN. THE FOLLOWING ERRORS CAN BE
2194 INDICATED
2195 EXT COND ON ERROR 39
2196 DATA CHECK ON ERROR 40
2197 RECORD READ DOES NOT EQUAL RECORD WRITTEN ERROR 37
2198 HOME ADDRESS 1 DOES NOT EQUAL HOME ADDRESS 1 WRITTEN
2199 ERROR 38
2200 THE ROUTINE IS REPEATED FOR ALL 64 CHARACTERS UNLESS AN ERROR
2201 OCCURS IN WHICH CASE THE TEST IS TERMINATED.
2202
2203 FORMAT REQUIRED
2204 SAME AS FORMAT WRITTEN BY ROUTINE N13
2205
2206 DATA FIELD ORGANIZATION
2207 HAI 5CHARS--HA2 2 CHARs--REC ADDR 6 CHARs--RECORD 2 CHARs
2208
2209 DATA FIELD USED-HAI UPDATED 20-59--RECORD UPDATED FOR EVERY CHAR
2210 9#20888123456XX

2211	N15	NCP	1	06389	N
2212	DC	2152	2	06391	Q
2213	ZA	200002,X10	11	06392	M 09826 00074
2214	TST15	MRCG CEADDR,FILE	12	06403	D 09662 09891
2215	CS	DATAFD099	6	06415	/ 09999
2216			4	06421	, 09895

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PGLIN	LABEL	N15	OPCCD	OPERAND	CT	ADDRS	INSTRUCTION
2217		MRCWG	ALLBIT,DATAFD07	LOAD DATA FIELD	12	06427	D 09640 09907 L
2218		MLCS	ALLCHREX10,DATAFD014	WITH REC ADDR AND	12	06439	D 09LP6 09914 3
2219		MLCS	ALLCHREX10	TEST CHAR	6	06451	D 09LP6
2220		MRCG	FILE02,DATAFD	LOAD ADDRESS	12	06457	D 09893 09900 \$
2221	WRTHAO	MLCA	08880,DATAFD06	IN FIELD	12	06469	D 09859 09906 I
2222		MU	XF5,FILE,W	WRITE HAO	10	06481	M XF5 09891 W
2223		SUR	DATA04	STORE B ADDR REG	7	06491	G 01714 B
2224		BAI	STACHK	BRCH ON ANY IND	7	06498	R 03051 M
2225		C	DATA04,CON3	RETURN HERE	11	06505	C 01714 09661
2226		BE	0014	WAS ALL DATA TRANS	7	06516	J 06536 S
2227		***	SET ERROR 36 ON ***				
2228		SW	E36	SET ERROR IND ON	6	06523	, 01837
2229				WRITE HAO CP THE ENTIRE DATA FIELD WAS NOT TRANSFERRED,POSSIBLE			
2230				FAILURE OF FORMAT RECOGNITION CKTS.			
2231		B	N15XIT		7	06529	J 06811
2232		A	010,FILE05	ADD 1 TO TKHD ADK	11	06536	A 09809 09896
2233		BCE	008,FILE04,6	IS CYL COMPLETE	12	06547	B 06566 09895 6
2234		B	WRTHAO		7	06559	J 06457
2235		MLCS	DATAFD014,DATAFD031	SAVE TEST CHAR	12	06566	D 09914 09931 3
2236		MLCS			1	06578	D
2237		MRCG	CEADDR,FILE	RESET FILE ADDR	12	06579	D 09662 09891 \$
2238		CS	DATAFD014		6	06591	/ 09914
2239	ROHAO	MU	XF5,FILE,R	READ HAO	10	06597	M XF5 09891 R
2240		BEF1	SETE39	CHECK EXTERNAL COND	7	06607	R 06792 8
2241		BER1	SETE40	CHECK DATA CHECK	7	06614	R 06805 4
2242		BAI	STACHK	GO CHECK STATUS ERR	7	06621	R 03051 M
2243		SW	DATAFD030		6	06628	, 09930
2244		C	DATAFD014,DATAFD031	CHECK DATA READ	11	06634	C 09914 09931
2245		BE	008	IF IT IS GOOD BRCH	7	06645	J 06659 S
2246		B	SETE37		7	06652	J 06707
2247		CH	FILE04		6	06659	D 09895
2248		SW	FILE02,DATAFD		11	06665	, 09893 09900
2249		C	DATAFD05,FILE07	CHECK ADDRESS READ	11	06676	C 09905 09898
2250		BE	RONXTK	BRCH IF ADDR CORRECT	7	06687	J 06720 S
2251		***	SET ERROR 38 ON ***				
2252		SW	E38	SET ERROR IND ON	6	06694	, 01839

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DA04

CT ADDR INSTRUCTION

N15

OPCDD OPERAND

PGLIN

LABEL

2253 HOME ADDR 1 WRITTEN BY HAO OP DOES NOT COMPARE TO HCME ADDRESS
2254 READ BACK ADDRESS READ BACK IS IN DATA FIELD AT TIME ERROR IS IND
2255 POSSIBLE FAILURE IN THE LO-ORDER POSITIONS OF THE TRACK REGISTER.

2256 8 N15XIT

2257 *** SET ERROR 37 ON ***

2258 SETE37 SW E37 SET ERROR IND ON

2259 DATA RECORD READ BACK DOES NOT COMPARE TO DATA RECORD WRITTEN.

2260 POSSIBLE FAILURE IN READ-WRITE PATHS. DATA RECORD READ IS IN DATA

2261 FIELD WHEN ERROR IS INDICATED.

2262 8 N15XIT

2263 RDNXTK SW FILEE4

2264 A 212,FILEE5 ADD 1 TO TKHD ADDR

2265 BCE *E8,FILEE4,4 IS CYL COMPLETE

2266 B ROMAO

2267 A 212,X10 ADD 1 TO CHAR COUNT

2268 C X10,26C2 ALL CHARACTERS CHKD

2269 BE N15XIT IF SO BRCK

2270 B TST15

2271 *** SET ERROR 39 ON ***

2272 SETE39 SW E39 SET ERROR IND ON

2273 READ HAO CAUSES EXT COND, POSSIBLE FAILURE OF PHASE SELECT CKTS

2274 ASSOCIATED WITH READ

2275 B N15XIT

2276 *** SET ERROR 40 ON ***

2277 SETE40 SW E40 SET ERROR IND ON

2278 READ HAO CAUSES DATA CHECK, POSSIBLE FAILURE OF PHASE SELECT CKTS

2279 OR READ DATA PATHS.

2280 N15XIT 8 MONITR

7 06700 J 06811

6 06707 , 01838

7 06713 J 06811

6 06720 , 09895

11 06726 A 09809 09896

12 06737 B 06756 09895

7 06749 J 06597

11 06756 A 09809 00074

11 06767 C 00074 09839

7 06778 J 06811 S

7 06785 J 06403

6 06792 , 01840

7 06798 J 06811

6 06805 , 01841

7 06811 J 02066

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DA04

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CT ADDR INSTRUCTION

PGLIN LABEL OPCCD OPERAND

2282 *** TEST ROUTINE DESCRIPTION ***

2283 *** TEST FLAGGING CAPABILITIES ***

2284

2285 THE ROUTINE REQUESTS THE NUMBER OF SPARE HEADS AVAILABLE FOR

2286 FLAGGING, USING THIS INFO THE PROGRAM WRITES A FLAG CHARACTER FOR

2287 HEAD AVAILABLE ON TRACKS 9#20-9#25 OR LESS, AND WRITES HOME ADDR-

2288 ESSES ON THE AVAILABLE ALTERNATES ALONG WITH A CODE CHARACTER.

2289 A REQUEST IS THEN MADE TO TURN OFF THE CE-HAD SWITCH, AND A READ

2290 HAC IS ISSUED TO AN UN-FLAGGED TRACK. IF THIS RESULTS IN EXT COND,

2291 ERROR #1 IS INDICATED. THE TRACK ADDRESS IS RESET TO ZERO AND AN-

2292 OTHER READ HAD IS ISSUED IF THIS DOES NOT CAUSE EXT COND ERROR 42

2293 IS INDICATED.

2294

2295 FORMAT REQUIRED

2296 SAME AS WRITTEN IN ROUTINE N13

2297

2298 DATA FIELD ORGANIZATION

2299 HAI 4 CHARS--FLAG CHAR--AA2 2 CHARS--CCODE CHARACTER

2300

2301 DATA FIELD USED--HAI UPDATED UP TO 9#25-

2302 9#20X88#

N16	NCP	DC	ZA	B	DCH	DCW	DCW	MLNS	MLNS	MLNS	MRCWG	CS	MRCG	PLCWS	MLCA
1	06818	N													
2	06820	Q													
11	06821	M	09826	00074											
7	06832	J	01607												
16	06854														
1	06856														
12	06858	D	06856	07016	I										
12	06870	D	06856	07133	I										
12	06882	D	06856	07349	I										
12	06894	D	09662	09891	L										
6	06906	/	09999												
12	06912	D	09893	09900	I										
12	06924	D	09807	09908	7										
12	06936	D	09863	09907	I										

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N16

PGLIN	LABEL	OPCCO	OPERAND	CT	ADDRS	INSTRUCTION
2318		MLCS	FLAGSEX10,FILEE6	12	06948	D 090P1 09897 3
2319		MU	ZF5,FILE,W	10	06960	M ZF5 09891 W
2320		BA1	*E1	7	06970	R 06977 M
2321		A	212,X10	11	06977	A 09809 00074
2322		SW	FILEE4	6	06988	* 09895
2323		A	212,FILEE5	11	06994	A 09809 09896
2324	CKALT1	BCE	*E8,X10,F	12	07005	B 07024 00074 F
2325		B	TST16	7	07017	J 06912
2326		MRCG	CEADDR,FILE	12	07024	D 09662 09891 S
2327		ZA	200002,X10	11	07036	M 09826 00074
2328	TST165	MRCG	FILEE2,DATAFD	12	07047	D 09893 09900 S
2329		MLCA	2N2,DATAFD67	12	07059	D 09804 09907 T
2330		MLCS	FLAGSEX10,DATAFD64	12	07071	D 090P1 09904 3
2331		MU	ZF5,FILE,W	10	07083	M ZF5 09891 W
2332		BA1	*E1	7	07093	R 07100 M
2333		A	212,X10	11	07100	A 09809 00074
2334		A	212,FILEE5	11	07111	A 09809 09896
2335	CKALT2	BCE	*E8,X10,F	12	07122	B 07141 00074 F
2336		B	TST165	7	07134	J 07047
2337		B	1YP1	7	07141	J 01593
2338		DCW	2CE-HAO OFF2,G	10	07157	
2339		H		1	07159	.
2340		CS	DATAFD69	6	07160	/ 09999
2341		MU	ZF5,FILE,R	10	07166	M ZF5 09891 R
2342		BA1	*E1	7	07176	R 07183 M
2343		BEF1	*E8	7	07183	R 07197 8
2344		B	*E7	7	07190	J 07203
2345		***	SET ERROR 41 ON ***			
2346		SW	E41	6	07197	* 01842
2347			SET ERROR IND ON			
2348			READ HAO FOLLOWING TURNING OFF CE-HAO SWITCH CAUSES EXTERNAL COND			
2349			POSSIBLY DID NOT WRITE HOME ADDRESSES CORRECTLY IN ROUTINE N15			
2349		MLCA	20002,FILEE3	12	07203	D 09847 09894 T
2350		MU	ZF5,FILE,R	10	07215	M ZF5 09891 R
2351		BA1	*E1	7	07225	R 07232 M
2352		BEF1	N16XIT	7	07232	R 07245 8
2353			CHECK FOR EXT COND			
		***	SET ERROR 42 ON ***			

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DA04 CT ADDR INSTRUCTION

N16 OPCOD OPERAND

6 07239 , 01843

SET ERROR IND ON

SW E42

READ HAD USING ADDRESS OF CYL 000 WHEN ACCESS IS AT CYL 253 DOES

NOT CAUSE EXT COND.POSSIBLE FAILURE OF CE-HAO SWITCH OFF OR ITS

ASSOCIATED CKTS.

7 07245 J 02066

N16XII 8 MONITR

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DA04

CT ADDRS INSTRUCTION

N17

OPCCO OPERAND

LABEL

GLIN

*** TEST ROUTINE DESCRIPTION ***
 *** TEST FLAG DETECTION AND SWITCHING ***
 THIS ROUTINE ADDRESSES EACH CF THE TRACRS FLAGGED IN ROUTINE 16
 WITH A READ HAO INSTRUCTION. THE DATA READ BACK IS CHECKED FOR THE
 CODE CHARACTER WRITTEN ON THE ALTERNATE TRACKS, IF THE CHARACTER
 IS NOT PRESENT ERROR 43 IS INDICATED.

FORMAT REQUIRED
 SAME AS WRITTEN IN ROUTINE N13

GLIN	LABEL	OPCCO	OPERAND	CT	ADDRS	INSTRUCTION
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1	07252	N
2	07254	
12	07255	D 09662 09891
6	07267	/ 09999
12	07273	D 09807 09918
10	07285	M 8F5 09891 R
7	07295	R 07302 M
12	07302	B 07327 09902 A
6	07314	, 01844
7	07320	J 02066
11	07327	A 09809 09896
12	07338	B 07357 09896
7	07350	J 07267
7	07357	J 02066

*** SET ERROR 43 ON ***
 SET ERROR IND ON
 READ HAO OF A FLAGGED TRACK DOES NOT READ ALTERNATE TRACK.

CHKFLG A 216, FILE 5 ADD 1 TO TKHD ADDR
 CKALT3 BCE N17XIT, FILE 5, 6 CYL COMPLETE
 N17XIT B TST17
 MONITR

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DA04 CT ADDRS INSTRUCTION

N19 OPCCD OPERAND

P:LIN LABEL

2123 *** TEST ROUTINE DESCRIPTION ***
2124 *** TEST WRITE TRACK WITH ADDRESSES OPER ***
2125
2126 THIS ROUTINE WRITES A RECORD AND READS IT BACK, IT COMPARES THE
2127 DATA READ WITH THE DATA WRITTEN. IF IT DOES NOT COMPARE EQUAL
2128 ERROR 46 IS INDICATED. ALL STATUS ERRORS ARE ALSO INDICATED.

2129
2130 FORMAT REQUIRED
2131 SAME AS WRITTEN BY ROUTINE N18

2132
2133 DATA FIELD ORGANIZATION
2134 REC ADDR 6 CHARS--RECORD 2 CHARS

2135
2136 DATA FIELD USED
2137 1234567-

2138	N19	NOP	ROUTINE ID	1	07478	N
2139	DC	2192	LOAD ADDR	2	07480	
2140	MRCG	CEADDR, FILE	CLEAR DATA FIELD	12	07481	D 09662 09891 \$
2141	CS	DATAFD099	LOAD DATA FIELD	6	07493	/ 09999
2142	MRCWG	ALLBITS, DATAFD	SET ADDR ABOVE TRCKS	12	07499	D 09640 09900 L
2143	MLCS	262, FILEES	THAT ARE FLAGGED	12	07511	D 09864 09896 3
2144	MU	2F6, FILE, W	WRITE TRCK WITH ADDR	10	07523	M 2F6 09891 M
2145	BAI	STACHK	BRCH ON ANY IND	7	07533	R 03051 M
2146	CS	DATAFD07	RETURN HERE	6	07540	/ 09907
2147	MU	2F6, FILE, R	READ TRCK WITH ADDR	10	07546	M 2F6 09891 R
2148	BAI	STACHK	BRCH ON ANY IND	7	07556	R 03051 M
2149	C	DATAFD07, ALLBITS	RETURN HERE	11	07563	C 09907 09647
2150	BE	N19XIT	COMPARE DATA READ TO	7	07574	J 07587 S
2151			DATA WRITTEN			
2152						
2153						
2154	***	SET ERROR 46 ON ***		6	07581	, 01847
2155	SW	E46	SET ERROR IND ON			
2156			DATA READ DOES NOT COMPARE TO DATA WRITTEN			
2157	N19XIT	B MONITR		7	07587	J 02066

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DA04

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CT ADDR INSTRUCTION

P:LIN LABEL OPCCO OPERAND

N20

159 *** TEST ROUTINE DESCRIPTION ***
2160 *** TEST TRACK WITHOUT ADDRESSES OP ***
161
2162 THIS ROUTINE PERFORMS A TRACK WITHOUT ADDRESSES WRITE AND READ,
163 THE DATA READ IS COMPARED TO THE DATA WRITTEN AND IF IT DOES NOT
2164 COMPARE EQUAL ERROR 47 IS INDICATED. ALL STATUS ERRORS ARE ALSO
165 INDICATED.
166
167
168
169

FORMAT REQUIRED
SAME AS WRITTEN BY ROUTINE N18

DATA FIELD ORGANIZATION
RECORD 2 CHARS

DATA FIELD USED

173
174
175 N20 NOP
176 DC 2202 ROUTINE ID
2177 MRCG CEADDR, FILE LOAD ADDR
2178 CS DATAFD199 CLEAR DATAFD
2179 MRCWG ALLBIT16, DATAFD LOAD DATA FIELD
2180 MLC5 262, FILE15 SET ADDR ABOVE TRCKS
2181 TAHT ARE FLAGGED
2182 MU 2F2, FILE, W WRITE TRACK NO ADDR
2183 BAI STACHK GO TO STATUS ERROR
2184 CS DATAFD11 ROUTINE, RETURN HERE
2185 MU 2F2, FILE, R READ TRACK NO ADDR
2186 BAI STACHK GO TO STATUS ERROR
2187 SW DATAFD
2188 C ALLBIT17, DATAFD11 CHECK DATA READ BACK
2189 BE N20X11 IF IT IS GOOD BRCH
2190 *** SET ERROR 47 ON ***
2191 SW E47 SET ERROR IND ON
2192 DATA READ DOES NOT COMPARE WITH DATA READ
2193 N20X11 B MONIT

1 07594 N
2 07596
12 07597 D 09662 09891
6 07609 / 09999
12 07615 D 09646 09900
12 07627 D 09864 09891
10 07639 M 2F2 09891
7 07649 R 03051
6 07656 / 09901
10 07662 M 2F2 09891
7 07672 R 03051
6 07679 , 09900
11 07685 C 09647 09901
7 07696 J 07709
6 07703 , 01848
7 07709 J 02066

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CT ADDRS INSTRUCTION

N21
OPCOD OPERAND

195 *** TEST ROUTINE DESCRIPTION ***
196 *** TEST SINGLE RECORD OP ***
197
198 THIS ROUTINE PERFORMS A SINGLE RECORD WRITE AND READ, USING THE
199 RECORD ADDRESS WRITTEN IN ROUTINE N19. THE READ DATA IS COMPARED
200 TO THE WRITE DATA AND IF IT DOES NOT COMPARE ERROR 48 IS
201 INDICATED. ALL STATUS ERRORS ARE ALSO INDICATED.

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FORMAT REQUIRED

SAME AS WRITTEN BY ROUTINE N18

DATA FIELD USED

4-

N21	NCP	ROUTINE ID	ROUTINE DESCRIPTION
DC	221a	CLEAR DATA FIELD	
CS	DATAFD099	LOAD ADDR	
MLCA	ALLBIT05, FILE07	LOAD DATA FIELD	
MRCWG	ALLBIT06, DATAFC	WRITE SINGLE REC	
MU	0F1, FILE, W	GO TO STATUS ERROR	
BAL	STACHK	ROUTINE, RETURN HERF	
CS	DATAFD001	READ SINGLE REC	
MU	0F1, FILE, R	GO TO STATUS ERROR	
BAL	STACHK	ROUTINE RETURN HERF	
SW	DATAFD	CHECK DATA READ BACK	
C	ALLBIT07, DATAFD01	IF IT IS GOOD BRCH	
BE	N21XIT		
***	SET ERROR 48 ON ***		
SW	E48		
31141	DATA READ DOES NOT COMPARE TO DATA WRITTEN		
N21XIT	B		

1	07716	N
2	07718	
6	07719	/ 09999
12	07725	D 09645 09898 I
12	07737	D 09646 09900 L
10	07749	M 0F1 09891 W
7	07759	R 03051 M
6	07766	/ 09901
10	07772	M 0F1 09891 R
7	07782	R 03051 M
6	07789	, 09900
11	07795	C 09647 09901
7	07806	J 07819 S
6	07813	, 01849
7	07819	J 02066

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N22

CT ADDR5 INSTRUCTION

LABEL OPCCD OPERAND

POLIN

2.27	*** TEST ROUTINE DESCRIPTION ***				
2.28	*** TEST CYO OPERATION ***				
2.29					
30	IF CYO IS AVAILABLE A TRACK WITHOUT ADDR OP IS USED TO WRITE A				
2.31	2 CHAR RECORC CN EACH TRACK IN CYL 253,THE WRITTEN IS CO ON TRACK				
2.32	0.01 ON TRACK 1,AND SO ON THRU 39 ON TRACK 39.A READ CYO IS				
2.33	ISSUED,ADDRESSING THE BOTTOM TRACK ON CYL 253,AND THE DATA READ				
34	IS COMPARED TO THE 40 RECORDS WRITTEN.IF THE DATA READ DOES NOT				
35	COMPARE ERROR 49 IS INDICATED.THE 40 RECORDS ARE REWRITTEN USING				
36	A WRITE CYC AND THE PROGRAM BRANCHES BACK TO THE READ CYO.THE				
37	READ-WRITE CYO ARE REPEATED 10 TIMES.				
38					
39	FORMAT REQUIRED				
40	SAME AS WRITTEN BY ROUTINE N18				
41					
42	DATA FIELD ORGANIZATION				
2.43	40 2 CHARACTER RECORDS				
44					
45	DATA FIELD USED				
2.46	00010203040506070809101112131415161718192021222324252627282930313				
2.47	233343536373839				
48	N22 NCP				1 07826 N
2.49	DC 222a				2 07828
50	B TYP2				7 07829 J Q1607
2.51	DCW 2CYO2,G				3 07838
2.52	DCW 2 2,G				1 07840
2.53	BCE *28,-13,1				12 07842 B 07861 07840 I
54	B N22XIT				7 07854 J 08146
2.55	S TENCNT				6 07861 S 09341
56	MRCG CEADDR,FILE				12 07867 D 09662 09891 S
2.57	CS DATAFD299				6 07879 / 09999
58	MLCA 2002,DATAFC21				12 07885 D 09847 09901 I
59	MLCWS 2M2,DATAFD2				12 07897 D 09807 09902 7
2.60	MU 2F2,FILE,W				10 07909 M 2F2 09891 M
2.61	BAI STACHK				7 07919 R 03051 M
2.62	SW DATAFD,FILE24				11 07926 , 09900 09895

231

LINE	LABEL	OPCCO	OPERAND	CT	ADDRS	INSTRUCTION
190						
191			*** TEST ROUTINE DESCRIPTION ***			
192			*** TEST SEEK COMPLETE,BLOCK INTERRUPT,& RELEASE ***			
193			IF PRIORITY IS AVAILABLE A SEEK IS ISSUED AND ALERT MODE IS			
194			ENTERED.THE PROGRAM DELAYS AND IF NO INTERRUPT OCCURES FRMR 51			
195			IS INDICATED.IF THE INTERRUPT OCCURES A NO-OP IS ISSUED AND BUSY			
196			IS CHECKED.IF THE ACCESS IS STILL BUSY ERROR 52 IS INDICATED.IF			
197			THE 7631 IS A MODE 3 A SEEK IS ISSUED FOLLOWED BY A SFT BLOCK			
198			INTERRUPT AND THE PROGRAM ENTERS ALERT MODE.A DELAY FOLLOWS DURING			
199			WHICH TIME NO INTERRUPT SHOULD OCCURE,IF IT DOES ERROR 53 IS			
200			INDICATED.FINALLY A RELEASE INSTRUCTION IS ISSUED AND STATUS			
201			ERRORS ARE CHECKED.			
202						
203	N23	NCP		1	08153	N
204		DC	2230	2	08155	
205		BCE	088,1264,1	12	08156	B 08175 01264 1
206		B	N23XIT	7	08160	J 08577
207		B	TYP2	7	08175	J 01607
208		DCW	2 MOD 32,G	6	08187	
209		DCW	2 2,G	1	08189	
210		MLCA	200002,FILE55	12	08191	D 09826 09896 1
211		MRCWG	PRITST,108	12	08203	D 09758 00108 L
212		S	LNGCNT	6	08215	S 09454
213		SD	1,FILE	10	08221	M 2FO 09891 R
214		BA1	061	7	08231	K 06238 M
215		BEPA	061	7	08238	Y 08245 E
216	DELAYS	A	212,LNGCNT	11	08245	A 09809 09454
217		C	LNGCNT,232002	11	08256	C 09454 09868
218		BE	068	7	08267	J 08281 S
219		B	DELAYS	7	08274	J 08245
220		AXPA	061	7	08281	Y 08288 X
221			*** SET ERROR 51 ON ***			
222		SW	E51	6	08288	0 01852
223			A SEEK DOES NOT CAUSE AN INTERRUPT WHEN IT IS COMPLETE			
224		MRCWG	INTR,101	12	08294	D 02007 00101 L
225		B	N23XIT	7	08306	J 08577

232

N23

PGLIN	LABEL	OPCCD	OPERAND	CT	ADDRS	INSTRUCTION
2626	GOTINT	MU	XF0,FILE,V	10	08313	M XF0 09891 V
2627		MRCWG	INTR,101	12	08323	D 02007 00101 L
2628		BA1	*E1	7	08335	R 08342 M
2629		BCB1	*E8	7	08342	R 08356 2
2630		B	PREVNT	7	08349	J 08369
2631		***	SET ERROR 52 ON ***			
2632		SW	E52	6	08356	, 01853
2633			A SEEK CAUSES AN INTERRUPT WHEN IT IS COMPLETE,BUT A NO-OP INDI-			
2634			CATES THE ACCESS IS STILL BUSY			
2635		B	N23XIT	7	08362	J 08577
2636	PREVNT	BCE	*E8,MODNUM,1	12	08369	B 08388 08189
2637		B	N23XIT	7	08381	J 08577
2638		MRCWG	BLKIST,108	12	08388	D 09766 00108
2639		MLCA	29#202,FILES5	12	08400	D 09843 09896
2640		SD	1,FILE	10	08412	M XF0 09891 R
2641		BA1	*E1	7	08422	R 08429 M
2642		MU	*F4,FILE,W	10	08429	M *F4 09891 W
2643		BA1	*E1	7	08439	R 08446 M
2644		BEX1	STACHK,L	7	08446	R 03051 L
2645		BEPA	*E1	7	08453	Y 08460 E
2646		S	LNGCNT	6	08460	S 09454
2647	DELAY6	A	212,LNGCNT	11	08466	A 09809 09454
2648		C	LNGCNT,232002	11	08477	C 09454 09868
2649		BE	*E8	7	08488	J 08502 S
2650		B	DELAY6	7	08495	J 08466
2651		BXPA	*E1	7	08502	Y 08509 X
2652		B	RELEASE	7	08509	J 08541
2653		***	SET ERROR 53 ON ***			
2654	BADINT	SW	E53	6	08516	, 01854
2655			A SEEK OP FOLLOWED BY A SET BLCKC INTERRUPT DOES NOT BLOCK INTERPT			
2656		MRCWG	INTR,101	12	08522	D 02007 00101 L
2657		B	N23XIT	7	08534	J 08577
2658	RELEASE	MRCWG	INTR,101	12	08541	D 02007 00101 L
2659		MU	2F9,FILE,W	10	08553	M XF9 09891 W
2660		BA1	*E1	7	08563	R 08570 M
2661		BFV	STACHK,L	7	08570	R 03051 L

BRCH ON ANY BUT N T

N23

DA04

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GLIN LABEL OPGO OPERAND

CT ADDR INSTRUCTION

N23XIT B MONITR

7 08577 J 02066

ROUTINE, RETURN

662

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DA04 CT ADDR INSTRUCTION

N24 OPCCO OPERAND

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*** TEST ROUTINE DESCRIPTION ***
*** TEST WRITE INHIBIT, HAO, WRITE FORMAT SWITCHES ***

THIS IS RUN ONLY IN THE MANUAL MODE, IT BEGINS BY REQUESTING THAT
THE HAO, AND WRITE FORMAT SWITCHES BE TURNED OFF. WITH THESE
SWITCHES OFF A WRITE HAO IS ISSUED AND NOT READY IS CHECKED, IF IT
IS NOW ON ERROR 54 IS INDICATED. A WRITE FORMAT WITH WDC OP IS
ISSUED AND EXT COND IS CHECKED, IF IT IS NOT ON ERROR 55 IS INDI-
CATED. THE ROUTINE REQUESTS THAT THE HAO AND WRITE INHIBIT
SWITCHES BE TURNED ON. A WRITE CP TRY TO RE-WRITE A RECORD AND
READ IT BACK, IF THE RECORD IS WRITTEN ERROR 56 IS INDICATED.

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RECORD USED WHEN ATTEMPTING HAO WRITE - HAO SWITCH OFF-
88123456+-

FORMAT USED WHEN ATTEMPTING WRITE FORMAT - WRT FMT SWITCH OFF-
4443333333343333333333341111112

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RECORD USED WHEN ATTEMPTING WRITE - WRITE INHIBIT SWITCH ON-
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N24	NCP	1	08584	N
2685	DC	2	08586	
2686	BCE	12	08587	B 08606 01005 1
2687	B	7	08599	J 08938
2688	B	7	08606	J 01593
2689	DCW	19	08631	
2690	H	1	08633	.
2691	MRCWG	12	08634	D 09662 09891 L
2692	MLCA	12	08646	D 09870 09901 I
2693	MRCWG	12	08658	D 09640 09902 L
2694	SD	10	08670	M 2F0 09891 K
2695	BCB1	7	08680	R 08670 2
2696	BAL	7	08687	R 08694 M
2697	MU	10	08694	M 2F5 09891 W
2698	BCB1	7	08704	R 08694 2
2699				

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DA04

PGLIN	LABEL	N24 OPCCD	OPERAND	CT	ADDRS	INSTRUCTION
2700		BAL	*E1	7	08711	R 08718 M
2701		BNRI	*E7	7	08718	R 08731 I
2702		***	SET ERROR 54 ON ***	6	08725	, 01855
2703		SW	E54	6	08731	/ 09999
2704			WRITE MAG CAN BE PERFORMED WITH MAG SWITCH OFF	6	08737	, 09900
2705		CS	DATAFD069	12	08743	D 09492 09900
2706		SW	DATAFD	12	08755	D 09561 09930
2707		MRCG	MAL-23,DATAFD	10	08767	M XF7 09891 M
2708		MRCWG	RECAOR-1,DATAFD030	7	08777	R 08767 Z
2709		MU	XF7,FILE,M	7	08784	R 08791 M
2710		BCB1	*-16	7	08791	R 08804 8
2711		BAL	*E1	6	08798	, 01856
2712		BEF1	*E7	7	08804	J 01593
2713		***	SET ERROR 75 ON ***	24	08834	
2714		SW	E55	1	08836	
2715			WRITE FORMAT CAN BE PERFORMED WITH WRITE FORMAT SWITCH OFF	6	08837	/ 09999
2716		B	TYPI	12	08843	D 09872 09901 I
2717		DCW	WRITE INHIBIT MAG SWS ON2,G	12	08855	D 09807 09902 7
2718		H	WAIT FOR ACTION	10	08867	M XF2 09891 M
2719		CS	DATAFD069	7	08877	R 08884 M
2720		MLCA	2992,DATAFD01	6	08884	/ 09901
2721		MLCWS	2M2,DATAFD02	10	08890	M XF2 09891 R
2722		MU	XF2,FILE,M	7	08900	R 08907 M
2723		BAL	*E1	11	08907	C 09901 09872
2724		CS	DATAFD01	7	08918	J 08932 S
2725		MU	XF2,FILE,R	7	08925	J 08938
2726		BAL	*E1	6	08932	, 01857
2727		C	DATAFD01,2992			
2728		BE	*E8			
2729		B	N24XIT			
2730		***	SET ERROR 56 ON ***			
2731		SW	E56			
2732			WRITE TRACK WITHOUT ADDR CAN BE PERFORMED WITH WRITE INHIBIT			
2733			SWITCH ON			
2734		N24XIT	B			
			MONITOR			
				7	08938	J 02066

B MONITOR

7 09129 J 02066

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N26

CT ADDR INSTRUCTION

PGLIN LABEL OPCODE CPERAND

PGLIN	LABEL	OPCODE	CPERAND	CT	ADDR	INSTRUCTION
2800		...	TEST ROUTINE DESCRIPTION ...			
2801		...	DA04 CONSTANTS ...			
2802		DCW	202	1	09341	
2803	TENCNT	DCW	2E REG2,G	5	09342	
2804	EREG	DCW	2B REG2,G	5	09348	
2805	BREG	DCW	RESET1	7	09354	J 03554
2806	BRCH0	B	2MA	1	09361	
2807		DCW	HANG1	7	09362	J 03697
2808	BRCH1	B	2MA	1	09369	
2809		DCW	30000002	6	09375	
2810	ZERO	DCW	3 .0BTHs=8,L-/.2SSMB#2.TPMABCDEFGHI.JKLMNOPQR+STUV2	50	09376	
2811	ALLCHR	DCW	2WXYZ05678912342,G	14	09439	
2812		DC	2ACDR F1D2,G	8	09441	
2813	ACCRES	DC	30000002	5	09454	
2814	LNGCNT	DCW	HANG2	7	09455	J 05124
2815	BRCH2	B	2MA	1	09462	
2816		DCW	HANG3	5	09467	09938
2817	CON1	DCW	DATAFD018	7	09468	J 05564
2818	BRCH3	B	2MA	1	09475	
2819		DCW	2ILLGL CHAR2,G	10	09476	
2820	CHRPES	DCW	DATAFD028	5	09491	09928
2821	CON2	DCW	24443333333333333333333333333342	24	09515	
2822	HA1	DCW	21111112	6	09521	
2823	HA2	DC	22222222222222	12	09533	
2824	LONGAP	DCW	211111111111111111111111111122,G	29	09562	
2825	RECAUR	DC	24443333333333333333333333333342,G	37	09564	
2826	TSTFMT	DCW	24441111111111111111111111111122,G	37	09602	
2827	TSTFT6	DCW	21234568-2,G	8	09640	
2828	ALLBIT	DCW	HANG4	7	09649	J 06338
2829	BRCH4	B	2MA	1	09656	
2830		DCW	DATAFD016	5	09661	09916
2831	CON3	DCW	2009#20882,G	8	09662	
2832	CEADDR	DCW	21245672	6	09671	
2833	FLAGS	DCW	20001020304050607080910111213141516171819202122232422	50	09726	
2834		DCW	22 272 303 334 637 22,G	30	09750	

PGLIN

DC

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22,G

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09750

CT	ADDRS	INSTRUCTION
00	000000	000000
01	000001	000001
02	000002	000002
03	000003	000003
04	000004	000004
05	000005	000005
06	000006	000006
07	000007	000007
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10	000010	000010
11	000011	000011
12	000012	000012
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PGLIN	LABEL	OPCCO	OPERAND	CT	ADDRS	INSTRUC
2836	PRIITST	8	GQIINT G	7	09758	J 08313
2837		DCW	AMa	1	09765	
2838	BLKTST	8	BACINT G	7	09766	J 08516
2839		DCW	AMa	1	09773	
2840	CODE3	DCW	a a	3	09776	
2841		DCW	axR12	3	09779	
2842		DCW	axX2a G	3	09782	
2843		DCW	axM33a	3	09785	
2844		DCW	a.14a	3	09788	
2845	CVRLAP	DCW	a a	3	09791	
2846			axaxa	3	09794	
2847			axaxa	3	09797	
2848			axaxa	3	09800	
2849			axaxa	3	09803	
2850		LIORG			09804	
2850			axa	1	09804	
2850			axa D	1	09805	
2850			axa G	1	09806	
2850			AMa	1	09807	
2850			a a	1	09808	
2850			axa	1	09809	
2850			axaxaxa	5	09814	
2850			axa	1	09815	
2850			axa	1	09816	
2850			axaxaxa	5	09821	
2850			axa	1	09822	
2850			axaxaxa	4	09826	
2850			axaxa	2	09828	
2850			N26	5	09833	09136
2850			axaxaxa	4	09837	
2850			axaxa	2	09839	
2850			axaxaxa	4	09843	
2850			ax11a	2	09845	
2850			axaxa	2	09847	
2850			ax776ax	4	09851	
2850			ax11a	2	09853	

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PGLIN LABEL OPCCO OPERAND CT ADDR INSTRUCTION

2850			322a	2	09855	
2850			34a	1	09856	
2850			388a	3	09859	
2850			388Aa	4	09863	
2850			36a	1	09864	
2850			33200a	4	09868	
2850			388a	2	09870	
2850			399a	2	09872	
2850			357a	2	09874	
2850			N01	5	09879	03511
2851		ORG	9891		09891	
2852	FILE	DCW	2009#2088a.G	8	09891	
2853	DATAFD	DCW	a 6	1	09900	
2854		DS	98		09998	
2855		END				

END OF ASSEMBLY

6.05.00.0 DA05 MECHANICAL AND HYDRAULIC TEST DESCRIPTION

This test obsoletes DA05 . This test uses an oil warm-up routine before beginning the testing of the access.

The program tests every available module on every channel in an automatic or manual mode. The automatic mode requires no manual intervention and can be run from a Load-and-Go maintenance tape. The manual mode does require intervention and cannot be run unattended.

The program starts by running a five-minute oil warm-up routine; if in manual mode, an additional 20 minutes is run, and then proceeds to test the piston, Lo Glob, and Hi Glob Adders. Ten passes through a worse case seek routine are made, followed by 100 passes through a random seek test. The program now times the three basic seek times with the access being moved from the outside portion of the disk inward to the center. The three basic seek times are checked again with the access being moved from the center of the disk outward toward the edge of the disk. The results of the timing tests are printed on the console and the next available module is tested.

6.05.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program. In addition, the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

- A. Write HAO switch on (on all 7631's to be tested).
- B. *Write Inhibit switch on (on all 7631's to be tested).
- C. All 1301 modules not to be tested are set inoperative.

*NOTE: Write Inhibit switch need only be turned on when running in manual mode.

01.2 SPECIAL REQUESTS (MADE ONLY IN THE MANUAL MODE)**A. "CE-HAO ON"**

CE turns on CE HAO switch and presses start. This request is made if during the random seek test the access fails to position correctly. With the CE-HAO switch on, the HAl is read into memory and displayed on the typewriter.

6.05.01.0 OPERATING PROCEDURE (continued)**B. "ADDR READ, 0000000, CE-HAO OFF"**

The CE turns off the CE-HAO switch and presses start to continue.

01.3 SPECIAL TAD'S

There is one special TAD for this program (memory location 01004). IF THIS TAD IS SET TO "1," the program will run in the manual mode. This TAD is set to "1" when the program is loaded.

01.4 STANDARD OPTIONS

Two of the standard options are not available with this program, they are:

- A. Alter Routine Sequence - option code 3
- B. One Instruction Loop - option code 5

01.5 MANUAL MODE

When the manual mode has been selected, the program:

- A. Runs the oil warm-up routine for a total of 25 minutes.
- B. Requests intervention when access fails to position correctly in the random seek test.

01.6 SUMMARY TYPEOUT

The summary of errors typeout is not available with this program.

6.05.02.0 OPERATING HINTS**02.1 SELECTING MANUAL MODE (ALTER SPECIAL TAD)**

Use program option code 2 (alter memory) to alter special TAD 1 to a 1 or 1. Manual mode should normally be selected during the first five minute warm-up period. Special TAD memory location 01004.

6.05.02.0 OPERATING HINTS (continued)**02.2 POWER ON WARM-UP**

If power has just been brought up, the additional 20 minute warm-up must be run for valid results. To run the extra 20 minute warm-up, select manual mode during the first five minute warm-up.

6.05.03.0 PROGRAM STOPS**03.1 ERROR STOPS**

None

03.2 NORMAL STOPS (MANUAL MODE ONLY)**Memory Loc.****Reason**

5071
53

Wait for CE to turn on CE-HAO switch and press start.

5148
56

Wait for CE to turn off CE-HAO switch and press start.

6.05.04.0 TYPEOUTS (OTHER THAN REQUEST OR STANDARD TYPEOUTS)**04.1 "AUTO MODE, HAO SWITCH ON"**

This is to remind the CE that this program runs in automatic mode when loaded and that the HAO switch on the 7631 must be on.

04.2 "TST MOD 0 CH 0"

This tells the CE which module on which channel is being tested at present.

04.3 "BEGINNING 5 MINUTE WARM-UP"

"BEGIN 20 MINUTE WARM-UP"*

"WARM-UP COMPLETE TEST BEGINNING"

These typeouts are simply reference points to let the CE know where he is at.

*NOTE: The 20 minute message is given only when running in manual mode.

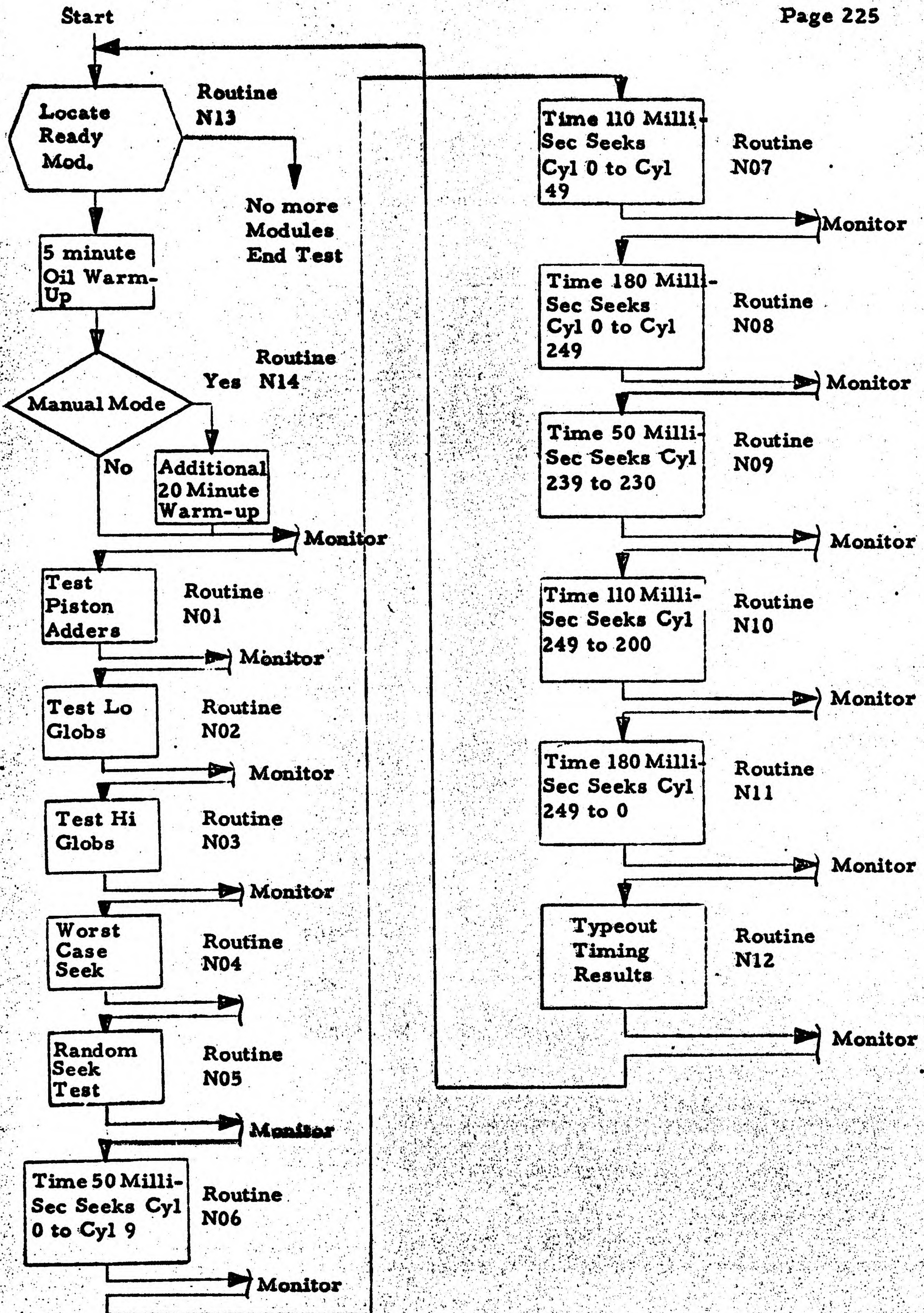
6.05.04.0 TYPEOUTS (continued)

04.4 Seek time results are typed in the following table after all the timings have been made.

Seek -	<u>From</u>	<u>To</u>	Time -	<u>Was</u>	<u>Should be</u>	In MSEC
	0000	0360			50	
	0000	1960			110	
	0000	9960			185	
	8760	8400			50	
	9960	8000			110	
	9960	0000			185	

6.05.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.



6.05.06.0 ROUTINE/ERROR INDEX DA05

This index should be used to locate routines and errors in the program listing.

<u>Routine Number</u>	<u>Error Number</u>	<u>Page</u>
N01	02	248
	04	249
N02	06	250
	08	251
N03	10	252
	12	252
N04	14	254
N05	16	255
N06		257
N07		258
N08		259
N09		260
N10		261
N11		262
N12		263
N13		264
N14		266

247

DAOP CT ADDR INSTRUCTION

L/D DICOST DEFINE TADS

OPCODE OPERAND

PGLIN LABEL

1002 CTL 2

DEFINE STANDARD TADS

ORG 1000

DCW 2 2

2 2

2 2

TAD0

TAD1

TAD2

TAD3

DEFINE SPECIAL TADS

DCW 2 2

2 2

2 2

2 2

2 2

2 2

2 2

2 2

2 2

SPTAD0

SPTAD1

SPTAD2

SPTAD3

SPTAD4

SPTAD5

SPTAD7

SPTAD8

SPTAD9

01000

1 01000

1 01001

1 01002

1 01003

01004

1 01005

1 01006

1 01007

1 01008

1 01009

1 01010

1 01011

1 01012

1002

1003

1004

1005

1006

1007

1008

1009

1010

1011

1012

1013

1014

1015

1016

1017

1018

1019

1020

1021

1022

1023

I/O DICOST ONE INSTRUCTION LOOP

DA05 PAGE 228

CT ADDR INSTRUCTION

LABEL

OPCODE OPERAND

PGLIN

1025 *** I/O DICOST PROGRAM ***

1026 *** ONE INSTRUCTION LOOP ROUTINE ***

1027 WHEN THE CB SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION

1028 IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED. NOTE THAT THE

1029 BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.

1030 LOOP MU X11,0,R I/O INST BEING LUP D

1031 8A1 001

1032 BNQ PRGCTL

1033 B LOOP

1034 H

1035

20 01013 M X11 00000 R

7 01023 R 01030 M

7 01030 J 02238 Q

7 01037 J 01013

1 01044 .

I/O DICOST CHANNEL ALTER

CT ADDR INSTRUCTION

1037 *** I/O DICOST PROGRAM ***

1038 *** CHANNEL ALTER ROUTINE ***

1039 THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS, BRANCH-ON-STATUS-
 1040 INDICATOR-ON INSTRUCTIONS, AND BRANCH ON CHANNEL OVERLAP IN PRO-
 1041 CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED. THIS IS DONE
 1042 BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRU-
 1043 TIONS.

PGLIN	LABEL	OPCODE	OPERAND	CHALTR	SBR	X5	STORE ADDR	CT	ADDR	INSTRUCTION
1044								7	01045	G 00049 B
1045								12	01052	D 00449 00059 T
1046								12	01064	D 00449 00449 B
1047	SCAN	SCNLA	06X6,06X6					7	01076	G 00054 A
1048		SAR	X6					11	01083	C 00054 00059
1049		C	X6,X7					7	01094	J 00449 U
1050		BH	136X5					12	01101	D 00449 01124 3
1051		MLCS	16X6,*612					12	01113	B 01149 02563
1052		BCE	MLORU, CODES,					1	01125	B
1053		BCE						1	01126	B
1054		BCE						6	01127	B 01168
1055		BCE	RX30R1					1	01133	B
1056		BCE						1	01134	B
1057		BCE						1	01135	B
1058		BCE						6	01136	B 01187
1059		BCE	JAY					7	01142	J 01064
1060		B	SCAN					12	01149	D 00449 00449 2 3
1061	MLORU	MLCS	106X5,26X6					7	01161	J 01064
1062		B	SCAN					12	01168	D 00449 00449 1 3
1063	RX30R1	MLCS	116X5,16X6					7	01180	J 01064
1064		B	SCAN					12	01187	D 00449 01210 3
1065	JAY	MLCS	76X6,*612					12	01199	B 01221 02567
1066		BCE	ONE234,MODS,					1	01211	B
1067		BCE						1	01212	B
1068		BCE						1	01213	B
1069		BCE						7	01214	J 01064
1070		B	SCAN					12	01221	D 00449 00449 7 3
1071	ONE234	MLCS	126X5,76X6					7	01233	J 01064
1072		B	SCAN							

I/O DICOST CHANNEL ALTER

CT ADDR INSTRUCTION

PGLIN LABEL

OPCOD OPERAND

1073

H

1 01240 .

1074

1075

1076

1077

1078

ORG 1233

01233

1079

DCW 2FN2FJRFJZFI305+92

17 01249

1080

DEFINE PROGRAM TITLE

1081

1082

1083

ORG 1250

01250

1084

DCW 2DA05C2.G

5 01254

1085

LOCATE THE SYSTEM & CHANNEL CARDS

1086

1087

1088

ORG 1256

01256

1089

DC

2

50

01256

1090

2

7

01312

1091

ORG 1289

01289

1092

DC

2

50

01289

1093

2

7

01345

1094

ORG 1346

01346

1095

DC

2

50

01346

1096

2

7

01402

1097

ORG 1403

01403

1098

DC

2

50

01403

1099

2

7

01459

1100

ORG 1460

01460

1101

DC

2

50

01460

1102

2

7

01516

1103

PGLIN	LABEL	L/O DICOST TYPE	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1105		*** L/O DICOST PROGRAM ***					
1106		*** TYPE AND REQUEST FOR INTERVENTION ***					
1107		THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR					
1108		MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON					
1109		DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE					
1110		BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ					
1111		CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE					
1112		ALL MESSAGES IN THIS PROGRAM.					
1113							
1114							
1115							
1116							
1117							
1118							
1119							
1120							
1121							
1122							
1123							
1124							
1125							
1126							
1127							
1128							
1129							
1130							
1131							
1132							
1133							
1134							
1135							
1136							
1137							
1138							
1139							
1140							

PGLIN	LABEL	L/O DDCOST TYPE	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION	DAOS	PAGE
1141		CW		REPLY61	6	01697	01652		
1142		B		06X1	7	01703	J 00000		
1143	DATA	MLCWS		000, PASS1	12	01710	D 06868 01944		7
1144		BCE		0813, 1264, 1	12	01722	8 01746 01264		1
1145		MLCWS		000, MONITR67	12	01734	D 06868 02073		7
1146		MRCWG		089, 1230	12	01746	D 01766 01230		L
1147		B		PASS167	7	01758	J 01951		
1148		H			1	01765	.		
1149		DC		0.732	3	01768			
1150		DCW		0J2	1	01769			
1151		DC		SCAN	5	01774	01964		
1152		DC		0 2	1	01775			
1153		DCW		0.2.6	1	01776			
1154		DS		12		01789			

*** ERROR TABLES THESE ARE USED FOR ERROR ***

●●● SUMMARIES AND ERROR IDENTIFICATION ●●●

L/D DICOST TYPE

DPCOD OPERAND

PGLIN LABEL

CT	ADDRS	INSTRUCTION
1	01817	
1	01818	
1	01819	
1	01820	
1	01821	
1	01822	
1	01823	
1	01824	
1	01825	
1	01826	
1	01827	
1	01828	
1	01829	
1	01830	
1	01831	
1	01832	
1	01833	
1	01834	
1	01835	
1	01836	
1	01837	
1	01838	
1	01839	
1	01840	
1	01841	
1	01842	
1	01843	
1	01844	
1	01845	
1	01846	
1	01847	
1	01848	
1	01849	
1	01850	
1	01851	
1	01852	

PGLIN	LABEL	DPCOD	OPERAND
1177	E16		2 2
1178	E17		2 2
1179	E18		2 2
1180	E19		0 2
1181	E20		2 2
1182	E21		2 2
1183	E22		2 2
1184	E23		2 2
1185	E24		2 2
1186	E25	DC	2 2
1187	E26	DC	2 2
1188	E27		2 2
1189	E28		2 2
1190	E29		2 2
1191	E30		2 2
1192	E31		2 2
1193	E32		2 2
1194	E33		2 2
1195	E34		2 2
1196	E35		2 2
1197	E36		2 2
1198	E37		2 2
1199	E38		0 2
1200	E39		2 2
1201	E40		2 2
1202	E41		0 2
1203	E42		2 2
1204	E43		2 2
1205	E44		2 2
1206	E45		0 2
1207	E46		2 2
1208	E47		2 2
1209	E48		2 2
1210	E49		2 2
1211	E50		2 2
1212	E51	DC	2 2

PGLIN	LABEL	I/O DDCOST TYPE		CT	ADDRS	INSTRUCTION
		DPCOD	OPERAND			
1213	E52		0 0	1	01853	
1214	E53		0 0	1	01854	
1215	E54		0 0	1	01855	
1216	E55		0 0	1	01856	
1217	E56		0 0	1	01857	
1218	ERRTAB	DC	0+0	1	01858	
1219		DC	0 0	1	01859	
1220						

L/O DICOST INITIALIZE ROUTINE

OPCODE OPERAND

LABEL

PGLIN

*** INITIALIZE ROUTINE FOR THE DICOST PROGRAM ***

PRINT TITLE

WCP 1250

BCBL -16

BA1 61

CS 99

SW 25

MLCS 242,100

HRWR 25,30

HRCWG RESUME,1

HRCWG INTR,101

GO DO MORE INITIALIZING

B DATA

CW LPRT,SW1161

CS E56

MLCWS 242,STPTAB

B START

CLEAR AND RESET

ERROR TABLE

GO TO ROUTINE INIT.

H

ORG 2000

B INITLE

*** RESET & INTERRUPT ROUTINES, THESE ROUTINES ***

*** ARE MOVED TO LOCATIONS 1 & 101

RETURN TO PROG CNTRL

BNQ PRGCTL

DCW 242

B CKLUP

DCW 242

BN MONITR,LPRT

BN LOOP,LPINST

MLNA X3,X2

B MONITR67

CHECK FOR LOOP ROUT

CHECK INST LOOP SW

LOAD IX 2

GO TO MONITR

CT ADDR INSTRUCTION

10 01860 M XTO 01250 W

7 01870 R 01860 Z

7 01877 R 01884 M

6 01884 / 00099

6 01890 . 00025

12 01896 D 06869 00100

12 01908 D 00025 00030

12 01920 D 02015 00001

12 01932 D 02007 00101

7 01944 J 01710

11 01951 02575 01549

6 01962 / 01857

12 01968 D 06870 01801 7

7 01980 J 03377

1 01987 .

02000

7 02000 J 01860

7 02007 J 02238 Q

1 02014

7 02015 J 02023

1 02022

12 02023 V 02066 02575 1

12 02035 V 01013 02576 1

12 02047 D 00039 00034 /

7 02059 J 02073

I/O DICOST MONITOR

DA05 PAGE 236

CT ADDR INSTRUCTION

1253 *** I/O DICOST PROGRAM ***

1254 *** MONITOR ROUTINE ***

1255 THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED, OR
 1256 A STATUS ERROR HAS BEEN DETECTED AND INDICATED. IN THE CASE OF A
 1257 STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
 1258 THE STATUS ERROR WAS DETECTED. WHEN ENTERED FROM THE END OF A
 1259 TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY, THE
 1260 ROUTINE IS BEING LOOPEL, ANY ERRORS OCCURED, ALTER ROUTINE SEQUENCE
 1261 IS SELECTED, OR THE NEXT SEQUENTIAL ROUTINE SHOULD BE RUN.

1262

1263 MONITR SBR X2 STORE ADDR

1264 BXPA *61 EXIT ALERT MODE

1265 BNQ PRGCTL WAS THERE AN INQ

1266 BW 06X3,LPRT RETURN IF LOOPING RT

1267 MLCWS 0A2,224 SET WMGM SHORT MESG

1268 B ERRCTL

1269 NOP

1270 MLCWA X2,X3 LOAD IX3

1271 MLCWS 0 2,224 CLEAR WMGM

1272 B 06X2 GO TO NEXT ROUTINE

1273 MLCWS 0 2,224 CLEAR WMGM

1274 BCE *68,06X2,N BRCH IF ROUT COMP

1275 B 06X2 RETURN TO ROUTINE

1276 BZN *68,16X2,2 BRCH IF CHAR IS NUMR

1277 B 06X2 RETURN TO ROUTINE

1278 BZN *68,26X2,2 BRCH IF CHAR IS NUMR

1279 B 06X2 RETURN TO ROUTINE

1280 BW MONIT3,36X2 BRCH IF CHAR HAS WM

1281 B 06X2 RETURN TO ROUTINE

1282

7	02066	G	00034	B
7	02073	Y	02080	X
7	02080	J	02238	Q
12	02087	V	000M0	02575 1
12	02099	D	06871	00224 7
7	02111	J	02635	
1	02118	N		
12	02119	D	00034	00039 X
12	02131	D	06872	00224 7
7	02143	J	000.0	
12	02150	D	06872	00224 7
12	02162	B	02181	000.0 N
7	02174	J	000.0	
12	02181	V	02200	000.1 2
7	02193	J	000.0	
12	02200	V	02219	000.2 2
7	02212	J	000.0	
12	02219	V	02118	000.3 1
7	02231	J	000.0	

I/O DICOST PROGRAM CONTROL

 DAQS PAGE 237
 CT ADDR INSTRUCTION

```

1284      *** I/O DICOST PROGRAM ***
1285      *** PROGRAM CONTROL ***
1286      WHEN THE CB PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1287      THIS ROUTINE IS ENTERED. THE CE ENTERS ON THE TYPEWRITER THE
1288      OPTION CODE DESIRED, ALONG WITH THE DATA NEEDED BY THE OPTION. THE
1289      ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1290      THE OPTION.
1291
1292      READ THE CONSOLE PRT
1293      SBR  XI
1294      BEX1  PRGCTL, M
1295      SW    CTLFLD, 1
1296      BAI  *E1
1297      CH    LPRT, LPINST
1298      HLWS  *E1
1299      MRWR  E1, E2
1300      HLCS  CTLFLD, *E12
1301      BCE  ENDTST, CTLCOD,
1302      BCE  ALTADS
1303      BCE  ALTHEN
1304      BCE  LUPRT
1305      BCE  ONELUP
1306      BCE  RSTART
1307      BCE  CONT
1308      B     PRGCTL
1309      ALTADS  HLCA  CTLFLD, 4, 1003
1310      CS      MONIT1, 299
1311      ALTHEN  HLCA  CTLFLD, 5, *E9
1312      RCPW  O
1313      BEX1  *--16, M
1314      BAI  *E1
1315      CS      MONIT1, 299
1316      ALTHEN  HLCA  CTLFLD, 5, *E1
1317      SW      LPRT
1318      HLNA  CTLFLD, 5, X2
1319      CS      MONIT2, 299

```

BRCH ON ANY BUT WLR

TURN OFF LOOP SWS

CLEAR WM IN ERROR

TABLE

MOVE CTL CODE ENTERD

IS CTL CODE BLANK

IS CTL CODE 1

IS CTL CODE 2

IS CTL CODE 4

IS CTL CODE 5

IS CTL CODE 6

IS CTL CODE 7

MOVE IN NEW TADS

CLEAR OUT CTL FLD

MOVE ADDR TO BE ALTR

ALTER MEMORY

CHECK ALL BUT WLR

CLEAR THE CNTRL FLD

SET WMGH AT END

TURN ON LOOP SWITCH

LOAD IND REG2

CLEAR CNTRL FLD

I/O DICOST PROGRAM CONTROL

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1320	ONELUP	SW	LPINST	6	02488	02576
1321	LUPINT	NOPWM		1	02494	N
1322		B	018	7	02495	J 02509
1323		B	PREP	7	02502	J 06607
1324		CH	LUPINT&1	6	02509	02495
1325		B	LOOP	7	02515	J 01013
1326	RSTART	MLNA	CTLFLD&5,X2	12	02522	D 00206 00034 /
1327		CS	MONIT2,299	11	02534	/ 02099 00299
1328	CONT	CS	WHERE2,299	11	02545	/ 02150 00299
1329						

I/O DICOST CONSTANTS

1330	CODES	DCW	0J13XRULM0	8	02563	
1331	MOOS	DCW	043210	4	02567	
1332		DCW	070	1	02568	
1333		DC	060	1	02569	
1334			050	1	02570	
1335			040	1	02571	
1336			020	1	02572	
1337			010	1	02573	
1338	CTLCOD		0 0	1	02574	
1339	LPRT	DC	0 0	1	02575	
1340	LPINST	DC	0 0	1	02576	

ADDR OF ERR TABLE

01858

1341	ADDR02	DCW	ERRTAB	5	02581	01858
1342	ERR	DCW	0+ERROR0	6	02587	
1343	ACTION	DC	0REQ ERROR ACTION0,G	16	02588	
1344	ERCODE	DCW	0347P0	4	02608	
1345	SAVING	DCW	01 2 4 8 A 00,G	11	02609	
1346	STIND	DC	01 2 4 8 A 00,G	11	02621	
1347	NGERSW	DC	0 0	2	02633	
1348						
1349						

L/O DICOST ERROR CONTROL

CT ADDR\$ INSTRUCTION

LGLIN LABEL CPCODE OPERAND

1351 *** I/O DICOST PROGRAM ***
 1352 *** ERROR CONTROL ***
 1353 THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
 1354 ED ERRORS HAVE TO BE INDICATED, IF THERE ARE THIS ROUTINE BUILDS
 1355 THE ERROR MESSAGE AND HAS IF TYPED OUT. THIS ROUTINE ALSO CHECKS
 1356 TAD I TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
 1357

LOCATE FAILING INST

1360	ERRCTL	MLCA	X2,X5	LOAD IND REG 5	12	02635	D 00034	00049	T
1361		S	212,X5		11	02647	S 06873	00049	S
1362		SCNLA	06X5,06X5	SCAN THE ROUTINE	12	02658	D 00+00	00+00	B
1363		SAR	X5	STORE CHAR ADDR	7	02670	G 00049	A	
1364		MLCS	16X5,0612	MOVE CHAR TO BE CHKD	12	02677	D 00+01	02700	3
1365		BCE	GOTONE,CODES,	IS OP CODE M	12	02689	B 02733	02563	
1366		BCE		IS OP CODE L	1	02701	B		
1367		BCE	SHORT1	IS OP CODE U	6	02702	B 02752		
1368		C	X3,X5	HAS ROUTINE BEEN	11	02708	C 00039	00049	
1369		BL	LODFLO	SEARCHED	7	02719	J 02776	T	
1370		B	ERRCTL012	GO CONTINUE THE SRCH	7	02726	J 02647		
1371	GOTONE	MLCWA	106X5,LOOPE9	LOAD THE LOOP INST	12	02733	D 00+00	01022	X
1372		B	LODFLO		7	02745	J 02776		
1373	SHORT1	MLCWA	56X5,LOOPE9	LOAD THE LOOP INST	12	02752	D 00+05	01022	X
1374		MLCS	2N2,WOOP	SET NO-OP FOR SHORT	12	02764	D 06868	01013	3

INSTRUCTION

1375									
1376	LODFLO	MLCA	WOOPE9,234	MOVE FAILING OPER	12	02776	D 01022	00234	T
1377		MLNA	X3,223	MOVE ADDR OF ROUT	12	02788	D 00039	00223	/
1378		ZA	ADDR02,X1	LOAD ND REG 1	11	02800	H 02581	00029	
1379		ZA	2002092,X5	LOAD IND REG 5	11	02811	H 06878	00049	
1380				SCAN ERROR TABLE & UPDATA ERROR COUNT					
1381	ERSCAN	SCNLA	06X1,06X1	SCAN THE ERROR TABLE	12	02822	D 000+0	000+0	B
1382		SAR	X1	STORE ADDR	7	02834	G 00029	A	
1383		BCE	AFTSRH,16X1,L	HAS TABLE BEEN COMP.	12	02841	B 02900	000+1	L
1384		SN	X1-1	DEFINE ERROR	6	02853	,	00028	
1385		MLNWA	X1,06X5	MOVE ERROR CODE NO.	12	02859	D 00029	00+0	V
1386		A	232,X5	UPDATE IND REG 5	11	02871	A 06879	00049	

I/O DICOST ERROR CONTROL

DA05

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CT ADDR INSTRUCTION

OPCODE OPERAND

LABEL

PGLIN

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1387						
1388						
1389						
1390						
1391						
1392						
1393						
1394						
1395						
1396						
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1419						
1420						
1421						
1422						

*** I/O DICOST PROGRAM ***

*** DETERMINE WHICH STATUS INDICATORS ARE ON ***

THIS ROUTINE DETERMINE WHICH STATUS INDICATORS ARE ON, ON THE CHANNEL BEING USED. THE INDICATORS FOUND ON ARE STORED IN THE PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.

STACHK	SBR	X5	STORE ADDR IN IND 5
1419	SBR	X5	7 03063 G 00049 B
1420	SBR	X2	7 03070 G 00034 B
1421	BW	06X2,LPRT	12 03077 V 00050 02575 1
1422	9	272,X5	11 03089 S 06880 00049

REDUCE ADDR BY 7

I/O DICOST ERROR CONTROL

DA05

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PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1423		MLCS	0EX5, L00P610	12	03100	D 00440 01023 3
1424		MRCNG	STIND, 237	12	03112	D 02621 00237 1
1425		MLCS	0EX5, NUOPCO	12	03124	D 00440 03154 3
1426		B	CHALTR	7	03136	J 01045
1427		DCW	CNTERR	5	03147	03309
1428		DC	NOTROD	5	03152	03167
1429		DCW	2 2	1	03153	
1430	NUOPCO	DC	2 2	1	03154	
1431		DC	2 2	1	03155	
1432		ZA	2002372, X5	11	03156	M 06885 00049
1433	NOTROD	NOP		1	03167	N
1434		BNR1	CNTERR	7	03168	R 03309 1
1435		B	UPIX	7	03175	J 03340
1436	BUSY	NOP		1	03182	N
1437		BCB1	CNTERR	7	03183	R 03309 2
1438		B	UPIX	7	03190	J 03340
1439	BATAOK	NOP		1	03197	N
1440		BER1	CNTERR	7	03198	R 03309 4
1441		B	UPIX	7	03205	J 03340
1442	EXTCND	NOP		1	03212	N
1443		BEF1	CNTERR	7	03213	R 03309 8
1444		B	UPIX	7	03220	J 03340
1445	NOTRNS	NOP		1	03227	N
1446		BNT1	CNTERR	7	03228	R 03309 5
1447		B	UPIX	7	03235	J 03340
1448	WLR	NOP		1	03242	N
1449		BWL1	CNTERR	7	03243	R 03309 -
1450		B	UPIX	7	03250	J 03340
1451		SW	NOTROD, BUSY, 1	11	03257	, 03168 03183
1452		SW	DATACK, 1, EXTCND, 1	11	03268	, 03198 03213
1453		SW	NOTRNS, 1, WLR, 1	11	03279	, 03228 03243
1454		HRCG	237, SAV, IND	12	03290	D 00237 02609 5
1455		B	ERRCTL	7	03302	J 02635
1456	CNTERR	SBR	X6	7	03309	G 00054 8
1457		A	072, X6	11	03316	A 06880 00054
1458		CW	BRROSH, 1	6	03327	M 02913

I/O DICOST ERROR CONTROL

PCLIN	LABEL	ORCOD	OPERAND	CT	ADDRS	INSTRUCTION
1459		B	UPIXC19	7	03333	J 03359
1460	UPIK	SBR	X6	7	03340	G 00054 B
1461		MLCS	B 2.06X5	12	03347	D 06872 00+0 3
1462		A	222.X5	11	03359	A 06886 00049
1463		B	06X6	7	03370	J 000+0
1464						

STORE RETURN ADDR

REMOVE STATUS CHAR

UPDATE IND REG 5

RETURN TO PROGRAM



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DA05

CT ADDR5 INSTRUCTION

I/O DICOST SEQUENCE CONTROL

OPCOD OPERAND

LABEL

PCLIN

201

EQU

CTLFLO

1404

PST

1402

INITIALIZE FOR DA05

DA05

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CT ADDR INSTRUCTION

PGLIN LABEL

OPCODE OPERAND

1469 *** TEST ROUTINE DESCRIPTION ***

1470 *** INITIALIZE COUNTERS & DELAY CONSTANTS ***

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1471	START	SW	ADDR00E1	6	03377	• 04677
1472		CW	COLDSWEL	6	03383	• 03878
1473		S	LNGCHT	6	03389	S 04840
1474		S	WARMCT	6	03395	S 06839
1475		S	TIMCNT	6	03401	S 04834
1476		S	LOOPTI	6	03407	S 04828
1477		S	CORR	6	03413	S 06836
1478		S	COUNT	6	03419	S 06825
1479		S	RUTCNT	6	03425	S 06814
1480		ZA	2013082,X10	11	03431	H 06891 00074
1481		ZA	2000002,X15	11	03442	H 06896 00099
1482		BCE	C1410,1256,0	12	03453	8 03539 01256 0
1483		BCE	C14101,1256,1	12	03465	8 03508 01256 1
1484	C7010	MLCA	UOPX,LOOPTI	12	03477	D 06855 06828 T
1485		MLCA	CORRX,CORR	12	03489	D 06857 06836 T
1486		B	GETSET	7	03501	J 03563
1487	C14101	MLCA	CORRI,CORR	12	03508	D 06862 06836 T
1488		MLCA	LOOPTI,LOOPTI	12	03520	D 06860 06828 T
1489		B	GETSET	7	03532	J 03563
1490	C1410	MLCA	CORRO,CORR	12	03539	D 06867 06836 T
1491		MLCA	LOOPTI,LOOPTI	12	03551	D 06865 06828 T
1492	GETSET	B	TYPE1	7	03563	J 01593
1493		DCV	2AUTO MODE,HAO SWITCH ON2,G	23	03592	
1494		WCP	BLANK	10	03594	M 210 06818 W
1495		BAL	0E1	7	03604	R 03611 M
1496	TIMBIT	WCP	BLANK	10	03611	M 210 06818 W
1497		BAL	0E1	7	03621	R 03628 M
1498		BCBI	0E8	7	03628	R 03642 2
1499		B	COTEST	7	03635	J 03660
1500		A	203152,TOTIME	11	03642	A 06900 06823
1501		B	TIMEIT	7	03653	J 03611
1502	COTEST	ZA	M13,X3	11	03660	M 06348 00039
1503		B	M13610	7	03671	J 06358
1504						

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WARM UP HYDRAULIC OIL

DA05

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CT ADDR INSTRUCTION

PGLIN LABEL

OPCODE OPERAND

*** TEST ROUTINE DESCRIPTION ***

*** WARM UP HYDRAULIC OIL ***

THIS ROUTINE OPERATES THE ACCESS FOR 5 MINUTES IN ORDER TO INSURE THAT THE OIL IS AT 105 DEGREES TEMPERATURE SO THAT THE SEEK TIMINGS MAY BE MADE USING THE FAST OSCILATOR. A MESSAGE INDICATES THE BEGINNING AND END OF THE WARMUP PERIOD. IF POWER HAS JUST BEEN BROUGHT UP ON THE 1301 AN ADDITIONAL 20 MINUTE WARMUP PERIOD SHOULD BE TAKEN. THIS ADDITIONAL WARM-UP MAY BE SELECTED BY ALTERING SPECIAL TAD 0, LOC 1004 TO A 1-USE OPTION CODE 2 TO ALTER THE TAD WHILE IN THE FIRST 5 MINUTE WARM-UP PERIOD.

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
1506						
1507						
1508						
1509						
1510						
1511						
1512						
1513						
1514						
1515						
1516						
1517	N14	NOP		1	03678	N
1518		DC	0140	2	03680	
1519		B	TYPE1	7	03681	J 01593
1520		DCW	BEGINNING 5 MINUTE WARMUP2.G	24	03711	
1521		S	WARMCT	6	03713	S 06839
1522		S	LNGCNT	6	03719	S 06840
1523		HLNS	ADDR0001,ADR24901 SET MOD ADDR	12	03725	D 06677 06743
1524	BOTTOM	HLNS	ADDR0001,ADR12501 SET MOD ADDR	12	03737	D 06677 06787
1525	STARIG	SD	1,ADDR00 SEEK CYL 0	10	03749	M XF0 06676 R
1526		BCBL	--16	7	03759	R 03749 Z
1527		BAL	001	7	03766	R 03773 M
1528		SD	1,ADR125 SEEK CYL 125	10	03773	M XF0 06786 R
1529		BCBL	--16	7	03783	R 03773 Z
1530		BAL	001	7	03790	R 03797 M
1531		SD	1,ADR249 SEEK CYL 249	10	03797	M XF0 06742 R
1532		BCBL	--16	7	03807	R 03797 Z
1533		BAL	001	7	03814	R 03821 M
1534		A	210,WARMCT ADD 1 TO PASS COUNT	11	03821	A 06873 06839
1535		BCE	0815,WARMCT-2,5 BRCH ON 500TH PASS	12	03832	B 03858 06837 S
1536		B	MONITR	7	03844	J 02066
1537		B	STARIG	7	03851	J 03749
1538		BCE	008,SPTAD0,1 BRCH IF IN MANUAL MD	12	03858	B 03877 01004 1
1539		B	WARM	7	03870	J 03954
1540	COLDSW	NOPWM		1	03877	N
1541		B	NOMSG	7	03878	J 03912

BY PASS MESSAGE

WARM UP HYDRAULIC OIL

DA05

CT ADDR INSTRUCTION

OPCODE OPERAND

LABEL

PGLIN

1542	B	TYP1	7	03885	J 01593
1543	DCW	2BEGIN 20 MIN WARMUP2,G	19	03910	
1544	SW	COLD SW61	6	03912	0 03078
1545	S	WARMCT	6	03918	S 06839
1546	A	012,UNGCNT	11	03924	A 06873 06840
1547	BCE	WARM.LNGCNT,5	12	03935	B 03954 06840 5
1548	B	STAR16	7	03947	J 03749
1549	B	TYP1	7	03954	J 01593
1550	DCW	2WARMUP COMPLETE,TEST BEGINING2,G	29	03989	
1551	B	MONITR	7	03991	J 02066
1552					

ADD 1 TO LONG COUNT

TEST PISTON ADDRS CT ADDR5 INSTRUCTION

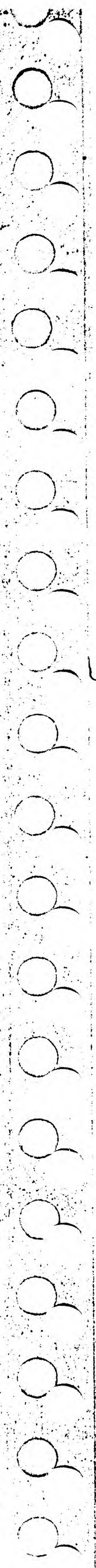
PGLIN LABEL OPCOD OPERAND

*** TEST ROUTINE DESCRIPTION ***

*** TEST PISTON ADDRS ***

THE ACCESS IS POSITIONED AT CYLINDER ZERO, IT IS THEN SEEKED TO CYLINDER 9, ACTUATING PISTONS S, 5, 4, 1. THE POSITION IS CHECKED BY A READ OP AND A NO RECORD FOUND RESULTS IN SETTING ERROR 2 ON. THE ACCESS IS RESET TO CYL ZERO AND THEN SEEKED TO CYL 2, ACTUATING PISTON 2. THE ACCESS POSITION IS VERIFIED BY A READ AND A NO RECORD FOUND CAUSES ERROR 4. THE ROUTINE IS REPEATED TEN TIMES.

1554	N01	NOP		1	03998	N
1555		DC	2012	2	04000	
1556	START1	SD	L, ADDR00	10	04001	M XF0 06676 R
1557		BCB1	16	7	04011	R 04001 Z
1558		BAL	STACHK	7	04018	R 03063 M
1559		MLNS	ADDR0001, ADDR901	12	04025	D 04677 06688 1
1560		SD	L, ADDR9	10	04037	M XF0 06687 R
1561		BCB1	16	7	04047	R 04037 Z
1562		BAL	STACHK	7	04054	R 03063 M
1563		MU	XF5, ADDR9, R	10	04061	M XF5 06687 R
1564		BCB1	16	7	04071	R 04061 Z
1565		BEX1	ERROR2, Y	7	04078	R 04190 Y
1566		BAL	161	7	04085	R 04092 M
1567	NINB	SD	L, ADDR00	10	04092	M XF0 06676 R
1568		BCB1	16	7	04102	R 04092 Z
1569		BAL	STACHK	7	04109	R 03063 M
1570		MLNS	ADDR0001, ADDR201	12	04116	D 06677 06699 1
1571		SD	L, ADDR2	10	04128	M XF0 06698 R
1572		BCB1	16	7	04138	R 04128 Z
1573		BAL	STACHK	7	04145	R 03063 M
1574		MU	XF5, ADDR2, R	10	04152	M XF5 06698 R
1575		BCB1	16	7	04162	R 04152 Z
1576		BEX1	ERROR4, Y	7	04169	R 04203 Y
1577		BAL	161	7	04176	R 04183 M
1578		B	NOICNT	7	04183	J 04209
1579		***	SET ERROR 2 ON ***	6	04190	0 01803
1580	ERROR2	SW	E2			
1581			TURN ON ERROR IND			



TEST PISTON ADDERS

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1590	ACCESS DID NOT ARRIVE AT CYLINDER 9, READ OP RESULTS IN EXT.COND.			7	04196	J 04092
1591	B NINE20					
1592	*** SET ERROR 4 ON ***			6	04203	. 01805
1593	ERROR4 SW E4		TURN ON ERROR IND			
1594	ACCESS DID NOT ARRIVE AT CYLINDER 2, READ OP RESULTS IN EXT.COND.			11	04209	A 06873 06814
1595	NOICNT A 012, RUTCNT		UPDATE PASS COUNT	12	04220	B 04239 06814 P
1596	BCE NOIXIT, RUTCNT, 0		BRCH WHEN CNT IS 10	7	04232	J 04001
1597	B START1			7	04239	J 02066
1598	NOIXIT B MONITR					
1599						

TEST. LO GLOBS
OPCODE OPERAND
CT ADDR INSTRUCTION

PGLIN

LABEL

TEST. LO GLOBS
OPCODE OPERAND

CT ADDR INSTRUCTION

*** TEST ROUTINE DESCRIPTION ***

*** TEST LO GLOB ADDRS ***

THE ACCESS IS POSITIONED AT CYLINDER ZERO, IT IS THEN SEEKED TO
CYLINDER 10, ACTUATING GLOB 10, A READ OP VERIFIES THAT THE ACCESS
ARRIVED AT CYL 10. ERROR 6 IS INDICATED IF THE READ OP RESULTS IN
A NO RECORD FOUND. THE ACCESS IS RESET TO CYL ZERO AND SEEKED TO
CYL 45. THE ACCESS ARRIVAL IS CHECKED BY A READ OP, A NO RECORD
FOUND RESULTS IN ERROR 8 BEING INDICATED. THE ROUTINE IS REPEATED
TEN TIMES.

1601	NOP	04246	N
1602	DC	04248	
1603	SD	04249	M XF0 06676 R
1604	BCB1	04259	R Q4249 Z
1605	BAL	04266	R 03063 M
1606	MLNS	04273	D 06677 06710 L
1607	SD	04285	M XF0 06709 R
1608	BCB1	04295	R 04285 Z
1609	BAL	04302	R 03063 M
1610	MU	04309	M XF5 06709 R
1611	BCB1	04319	R 04309 Z
1612	BEX1	04326	R 04438 Y
1613	BAL	04333	R 04340 M
1614	SD	04340	M XF0 06676 R
1615	BCB1	04350	R 04340 Z
1616	BAL	04357	R 03063 M
1617	MLNS	04364	D 06677 06721 H
1618	SD	04376	M XF0 06720 R
1619	BCB1	04386	R 04376 Z
1620	BAL	04393	R 03063 M
1621	MU	04400	M XF5 06720 R
1622	BCB1	04410	R 04400 Z
1623	BEX1	04417	R 04451 Y
1624	BAL	04424	R 04431 M
1625	B	04431	J 04457
1626	NO2CNT		
1627	NO2CNT		
1628	NO2CNT		
1629	NO2CNT		
1630	NO2CNT		
1631	NO2CNT		
1632	NO2CNT		
1633	NO2CNT		
1634	NO2CNT		
1635	NO2CNT		
1636	NO2CNT		

*** SET ERROR 6 ON ***

TEST LO GLOBS

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
1637	ERROR6	SW	B6	6	04438	01807
1638	ACCESS DID NOT ARRIVE AT CYL 10, READ RESULTS IN NO RECORD FOUND					
1639		B	TEN20	7	04444	J 04360
1640	*** SET ERROR 8 QN ***					
1641	ERROR8	SW	B8	6	04451	01809
1642	ACCESS DID NOT ARRIVE AT CYL 45, READ RESULTS IN NO RECORD FOUND					
1643	N02CNT	A	812, RUTCNT	11	04457	A 06873 06814
1644		BCE	N02XIT, RUTCNT, 0	12	04468	B 04487 06814 0
1645		B	START2	7	04480	J 04249
1646	N02XIT	B	MONITR	7	04487	J 02066
1647						

	1684	ERROR 12	SW	E12	TURN ON ERROR IND.
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
A					
B					
C					
D					
E					
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TEST HI 6LOBS

CT ADDR INSTRUCTION

PGLIN LABEL OPCOD OPERAND

1685 ACCESS DID NOT ARRIVE AT CYL 0, READ RESULTS IN NO RECORD FOUND

1686 N03CNT A 812, RUTCNT UPDATE PASS COUNT

1687 BCE N03XIT, RUTCNT, 0 BRCH WHEN COUNT IS 10

1688 B START3

1689 B MONITR

1690

11 04669 A 06873 06814
12 04680 B 04699 06814 0
7 04692 J 04497
7 04699 J 02066

275-

QT ADDR3 INSTRUCTION

RANDOM SEEK TEST
OPCOD OPERAND

PGLLN LABEL

1724 *** RANDOM SEEK TEST ***
1725 THE SPEED OF THE CARRIAGE RETURN IS USED TO DEVELOPE A RANDOM
1726 NUMBER WHICH IS USED TO DEVELOPE A RANDOM ADDRESS FOR THE FILE.
1727 ONE HUNDRED SEEKS USING RANDOM ADDRESSES ARE ISSUED,EACH SEEK IS
1728 CHECKED FOR CORRECT ACCESS POSITION WITH A READ OP.IF THE ACCESS
1729 WAS REZEROED ERROR 15 IS INDICATED.IF THE ACCESS HAS POSITIONED
1730 INCORRECTLY ERROR 16 IS INDICATED.IN THE CASE OF ERROR 16 IF THE
1731 PROGRAM IS IN MANUAL MODE,-SPECIAL TAD 0 IS 1-THE HAI ON THE FILE
1732 WILL BE READ OFF AND DISPLAYED ON THE CONSOLE FOR ANALYSIS.
1733

NO5	NOP	ROUTINE ID	1	04857	N
1734	DC	2052	2	04859	
1736	MLNWA	TOTIME,VARIABLES	12	04860	D 06823 06802 V
1737	MLNS	ADDR0001,VARIABLE1	12	04872	D 06677 06798 1
1738	SD	I,VARIAD	10	04884	M 3F0 06797 R
1739	BCB1	0-16	7	04894	R 04884 2
1740	BA1	STACHK	7	04901	R 03063 M
1741	MU	BF3,VARIAD,R	10	04908	M 3F5 06797 R
1742	BCB1	0-16	7	04918	R 04908 2
1743	BEX1	EROR16,Y	7	04925	R 04992 Y
1744	BA1	001	7	04932	R 04939 M

1745 RANDOM A 23002,TOTIME INCREASE VARIABLE
1746 SW VARIAD02 BY 300 AND ADD
1747 A TOTIME,VARIABLES RESULT TO TKHD ADR
1748 A 212,COUNT ADD 1 TO PASS COUNT
1749 BZ NOSXIT BRCH AFTER 100 PASS
1750 B STARTS
1751 *** SET ERROR 16 ON ***

RANDOM	A	23002,TOTIME	11	04939	A 06903 06823
1746	SW	VARIAD02	6	04950	, 05799
1747	A	TOTIME,VARIABLES	11	04956	A 06823 06802
1748	A	212,COUNT	11	04967	A 06873 06825
1749	BZ	NOSXIT	7	04978	J 05136 Y
1750	B	STARTS	7	04985	J 04860

1752 ERROR16 SW E16,EXTRA01 TURN ON ERROR IND
1753 ACCESS DID NOT POSITION CORRECTLY,READ RESULTS IN NO RECORD FOUND
1754 MRCWG VARIAD,DATA MOVE FAILING ADDR
1755 BA1 STACHK GO TO STATUS CHECK
1756 BCE 008,SPTAD0,1 BRCH IF IN MANUAL MD
1757 B RANDOM
1758 B TYP1 GO REQUEST THAT
1759 DCW BCE-HAO ON2,G CE-HAO BE TURNED ON

1752	1753	1754	1755	1756	1757	1758	1759
11	11	12	7	12	7	7	9
04992	04992	05003	05015	05022	05034	05041	05056
, 01817 02982		D 06797 01710 L	R 03063 M	B 05041 01004 1	J 04939	J 01593	

1760	H	WAIT FOR ACTION	1	05058	.
1761	MU	3F5,VAR1AD,R	10	05059	M 3F5 06797 R
1762	BC81	A-16	7	05069	R 05059 Z
1763	BA1	061	7	05076	R 05083 M
1764	MLCA	VARFLD&&,ADRMSC&&S	12	05083	D 06812 05117 T
1765	B	TYPI	7	05095	J 01593
1766	ADRMSC	QADDR READ	27	05102	
1767	H	CE-HAO OFF2,G	6	05130	. 04939
1768	N05XLT	WAIT FOR ACTION	7	05136	J 02066
1769	B	MONITR			

TIME 50 MILLI SEC SEEKS CYL 0 TO CYL 9

CT ADDR INSTRUCTION

DAOS

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PGLIN LABEL

OPCOD OPERAND

1771 *** TEST ROUTINE DESCRIPTION ***
1772 *** TIME 50 MILLIE SEC SEEKS,CYL 0 TO CYL 9 ***
1773 THE ACCESS IS POSITIONED AT CYL 0 AND THEN SEEKED TO CYL 9,THE
1774 ACCESS IS ISSUED ANOTHER SEEK AND THE BUSY LINE IS CHECKED,AS
1775 LONG AS THE BUSY LINE REMAINS UP THE PROGRAM STAYS IN A TIMING
1776 LOOP,WHEN BUSY DROPS THE PROGRAM STORES THE TIME THE BUSY LINE
1777 WAS UP AND GOES TO THE NEXT ROUTINE,ANY STATUS INDICATORS ENCOUN
1778 TERS WILL BE INDICATED.

NO6	NO6	ROUTINE 10	CT	ADDR	INSTRUCTION
1779	NOP		1	05143	N
1780	DC	3062	2	05145	
1781	S	TIMCNT	6	05146	S 06834
1782	MLNS	ADDR0001,ADDR961	12	05152	D 06677 06688 1
1783	SD	1,ADDR00	10	05164	M 2F0 06676 R
1784	BCBL	1-16	7	05174	R 05164 Z
1785	BA1	STACHK	7	05181	R 03063 M
1786	SD	1,ADDR9	10	05188	M 2F0 06687 R
1787	BCBL	1-16	7	05198	R 05188 Z
1788	BA1	STACHK	7	05205	R 03063 M
1789	SD	1,ADDR9	10	05212	M 2F0 06687 R
1790	BCBL	1-16	7	05222	R 05243 Z
1791	BA1	STACHK	7	05229	R 03063 M
1792	B	FIFTY	7	05236	J 05261
1793	A	COOPT1,TIMCNT	11	05243	A 06828 06834
1794	B	SHORT	7	05254	J 05212
1795	A	CORR,TIMCNT	11	05261	A 06836 06834
1796	MLNA	TIMCNT-3,OUT10020	12	05272	D 06831 06134 /
1797	B	MONITR	7	05284	J 02066

279

TIME 185 MILLI SEC SEEK CYL 0 TO 249

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CT ADDR INSTRUCTION

PGLIN LABEL OPCOD OPERAND

1830 *** TEST ROUTINE DESCRIPTION ***
 1831 *** TEST 185 MILLI SEC SEEKS, CYL 0 TO CYL 249 ***
 1832 THE ACCESS IS POSITIONED AT CYL 0, IT IS THEN SEEKED TO CYL 249.
 1833 THIS IS FOLLOWED BY A SECOND SEEK TO CYL 249. THE BUSY LINE IS
 1834 ELIMED AND WHEN IT FALLS THE PROGRAM STORES THE TOTAL TIME BUSY
 1835 WAS UP AND GOES ON TO THE NEXT ROUTINE. ALL STATUS INDICATORS
 1836 WHICH MAY COME ON WILL BE INDICATED.

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
1837	NOP			1	05439	N
1838	DC	0082		2	05441	
1839	MLNS	ADDR0001,ADR24901	SET MOD ADDR	12	05442	D 06677 06763 I
1840	S	TIMCNT	RESET TIME COUNT	6	05454	S 06834
1841	SD	1,ADDR00	RESET ACCESS	10	05460	M ZFO 06676 R
1842	BCBL	P-16		7	05470	R 05460 Z
1843	BAL	STACHK	BRCH ON ANY ERROR	7	05477	R 03063 M
1844	SD	1,ADR249	SEEK TO CYL 249	10	05484	M ZFO 06742 R
1845	BCBL	P-16		7	05494	R 05484 Z
1846	BAL	STACHK	BRCH ON ANY ERROR	7	05501	R 03063 M
1847	SD	1,ADR249	TRY ANOTHER SEEK	10	05508	M ZFO 06742 R
1848	BCBL	0015		7	05518	R 05539 Z
1849	BAL	STACHK	BRCH ON ANY ERROR	7	05525	R 03063 M
1850	B	ONE85		7	05532	J 05557
1851	A	LOOP TI, TIMCNT	ADD LOOP TIME TO	11	05539	A 06828 06834
1852	B	LONG	TOTAL SEEK TIME	7	05550	J 05508
1853	A	CORR, TIMCNT	ADD CORRECTION	11	05557	A 06836 06834
1854	MLNA	TIMCNT-3, OUT249020	MOVE TIME	12	05568	D 06831 06834 /
1855	B	MONITR		7	05580	J 02066

CT ADDR INSTRUCTION

PGLIN LABEL

OPCODE OPERAND

1659 *** TEST ROUTINE DESCRIPTION ***
1660 *** TEST 50 MILLI SEC SEEKS,CYL 239 TO CYL 230 ***
1661 THIS ROUTINE TIMES THE ACCESS ON A SEEK WHICH MOVES IT FROM AN
1662 INNER TRACK TO A TRACK FURTHER OUT ON THE DISK.THE ACCESS IS
1663 SET AT CYL 239 AND ISSUED A SEEK TO CYL 230.BY TESTING THE BUSY
1664 LINE THE PROGRAM TIMES THE SEEK,WHEN BUSY DROPS THE PROGRAM
1665 STORES THE TOTAL TIME AND CONTINUES TO THE NEXT ROUTINE.ANY
1666 STATUS INDICATORS THAT ARE TURNED ON WILL BE INDICATED.
1667

1668	NOP					1	05587	N
1669	OC	B092	ROUTINE ID			2	05589	
1670	MLNS	ADDR0021,ADR219&1	SET MOD ADDR			12	05590	D 06677 06765 1
1671	MLNS	ADDR0061,ADR210&1	SET MOD ADDR			12	05602	D 06677 06776 1
1672	S	TIMCNT	RESET TIME COUNT			6	05614	S 06834
1673	SD	I,ADR219	POSITION ACCESS			10	05620	H 2F0 06764 R
1674	BCBL	P-16				7	05630	R 05620 2
1675	BAL	STACHK	BRCH ON ANY ERROR			7	05637	R 03063 M
1676	SD	I,ADR210	SEEK TO CYL 210			10	05644	M 2F0 06775 R
1677	BCBL	P-16				7	05654	R 05644 2
1678	BAL	STACHK	BRCH ON ANY ERROR			7	05661	R 03063 M
1679	SD	I,ADR210	TIME THE SEEK			10	05668	M 2F0 06775 R
1680	BCBL	B&15				7	05678	R 05699 2
1681	BAL	STACHK	BRCH ON ANY ERROR			7	05685	R 03063 M
1682	B	FIVEO				7	05692	J 05717
1683	A	LOOPTI,TIMCNT	ADD LOOP TIME TO			11	05699	A 06828 06834
1684	B	SMALL	TOTAL SEEK TIME			7	05710	J 05668
1685	A	CORR,TIMCNT	ADD CORRECTION			11	05717	A 06836 06834
1686	MLNA	TIMCNT-3,OFF10&20	MOVE TIME			12	05728	D 06831 06251 /
1687	B	MONITR				7	05740	J 02066
1688								

TEST 185 MILLI SEC SEEK CYL 249 TO 0

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CT ADDR INSTRUCTION

PGLIN LABEL

OPCOD OPERAND

1921 *** TEST ROUTINE DESCRIPTION ***
 1922 *** TIME 185 MILLI SEC SEEKS,CYL 249 TO CYL 0
 1923 THIS ROUTINE TIMES A 185 MILLI SEC SEEK WITH THE ACCESS MOVING
 1924 FROM THE CENTER OF DISK TO THE OUTER TRACKS ON THE DISK.THE ACC-
 1925 ESS IS SET AT CYL 249 AND IS ISSUED 2 SEEKS TO CYL 0.THE FIRST
 1926 SEEK STARTS THE ACCESS MOVING THE SECOND BRINGS UP BUSY.THE DURA-
 1927 TION OF THE BUSY IS TIMED AND THE
 1928 TION OF THE BUSY IS TIMED AND THIS TIME IS STORED BEFORE THE
 1929 PROGRAM CONTINUES.ALL STATUS ERRORS WILL BE INDICATED.
 1930

LINE	OP	ADDR	INSTR	CT	ADDR	INSTR
1931	NOP			1	05907	N
1932	DC	2112	ROUTINE ID	2	05909	
1933	MLNS	ADDR00E1,ADR249E1	SET MOD ADDR	12	05910	D 06677 06743 1
1934	S	TIMECNT	RESET TIME COUNT	6	05922	S 06834
1935	SD	1,ADR249	POSITION ACCESS	10	05928	M 2FO 06742 R
1936	BCBL	--16		7	05938	R 05928 2
1937	BA1	STACHK	BRCH ON ANY ERROR	7	05945	R 03063 M
1938	SD	1,ADDR00	SEEK TO CYL 000	10	05952	M 2FO 06676 R
1939	BCBL	--16		7	05962	R 05952 2
1940	BA1	STACHK	BRCH ON ANY ERROR	7	05969	R 03063 M
1941	SD	1,ADDR00	TRY AGAIN	10	05976	M 2FO 06676 R
1942	BCBL	0E15	BRCH BUSY	7	05986	R 06007 2
1943	BA1	STACHK	BRCH ON ANY ERROR	7	05993	R 03063 M
1944	B	ONE80		7	06000	J 06025
1945	A	LOOPTI,TIMECNT	ADD LOOP TIME TO	11	06007	A 06828 06834
1946	B	LARGE	TOTAL SEEK TIME	7	06018	J 05976
1947	A	CORR,TIMECNT	ADD CORRECTION	11	06025	A 06836 06834
1948	MLNA	TIMECNT-3,OFF249E20	MOVE TIME	12	06036	D 06831 06329 /
1949	B	MONITR		7	06048	J 02066
1950						

DA05 INSTRUCTION

TYPE SEEK TIME RESULTS

OPCODE OPERAND

LABEL

PGLIN

1952 *** TEST ROUTINE DESCRIPTION ***
 1953 *** TYPE SEEK TIME RESULTS ***
 1954 USING THE RESULTS STORED BY THE SIX TIMING ROUTINES.A TABLE IS
 1955 COMPILED AND TYPED OUT.

PGLIN	LABEL	OPCODE	OPERAND	ROUTINE ID	CT	ADDRS	INSTRUCTION
1956							
1957	N12	NDP			1	06055	N
1958		DC	0120		2	06057	
1959		B	TYPI		7	06058	J 01593
1960		DCW	0SEEK FROM TO TIME WAS.SHOULD BE IN MSEC02.6		41	06105	
1961		B	TYPI		7	06107	J 01593
1962	OUT10	DCW	0 0000 0360	502.6	31	06114	
1963		B	TYPI		7	06146	J 01593
1964	OUT50	DCW	0 0000 1960	1102.6	31	06153	
1965		B	TYPI		7	06185	J 01593
1966	OUT249	DCW	0 0000 9960	1852.6	31	06192	
1967		B	TYPI		7	06224	J 01593
1968	OFF10	DCW	0 8760 8400	502.6	31	06231	
1969		B	TYPI		7	06263	J 01593
1970	OFF50	DCW	0 9960 8000	1102.6	31	06270	
1971		B	TYPI		7	06302	J 01593
1972	OFF249	DCW	0 9960 0000	1852.6	31	06309	
1973	N12XLT	B	MONITR		7	06341	J 02066
1974							

1976 *** TEST ROUTINE DESCRIPTION ***
1977 *** UPDATE CHANNEL & MODULE ROUTINE ***
1978 THIS ROUTINE STARTS WITH MODULE 0 ON CHANNEL 1 AND TESTS FOR A
1979 READY FILE, WHEN A READY FILE IS LOCATED THE PROGRAM IS ALTERED
1980 ACCORDING TO THE CHANNEL THE FILE IS ON. THE ROUTINE TYPES OUT THE
1981 MODULE AND CHANNEL NUMBER FOR EACH FILE FOUND READY.
1982

1983	N13	NOP		ROUTINE ID	1 05348 N
1984		DC	2132		2 05350
1985		B	TOP27		7 05351 J 06440
1986		BCE	*68,06X10,F	FILES ON THIS CHNL	12 06358 B 06377 00220 F
1987		B	UPCHNL	GO UPDATE FOR NEXT	7 06370 J 06465
1988		MLCA	CODE36X15,INCODE	MOVE CHANNEL CODES	12 06377 D 06H03 06408 T
1989		B	CHALTR	GO TO CHANNEL ALTER	7 06389 J 01045
1990		DCW	TOP	HIGH LIMIT	5 06400 06433
1991		DC	BOTTOM	LOW LIMIT	5 06405 03737
1992		DCW	2 2		1 06406
1993		DC	0 2		1 06407
1994		DC	2 2		1 06408
1995	INCODE	SD	1,ADDR00	SEEK THE ACCESS	10 06409 M 2F0 06676 R
1996	RDYFIL	BNRL	*615	BRCH NOT READY	7 06419 R 06440 1
1997		BA1	*61		7 06426 R 06433 M
1998	TOP	B	GOTIT	BRCH FOUND A RDY MOD	7 06433 J 06506
1999		A	212,ADDR0061	UPDATE MOD ADDR	11 06440 A 06873 06677
2000		BZ	*68	BRCH IF TEN MOD TR10	7 06451 J 06465 V
2001		B	RDYFIL		7 06458 J 06409
2002	UPCHNL	A	2572,X10	UPDATE	11 06465 A 06905 00074
2003		A	232,X15	IND REG 10615	11 06476 A 06879 00099
2004		BCE	ENDTST,X10,F	BRCH IF ALL CHL CHK	12 06487 B 06576 00074 F
2005		B	N13610	GO SEARCH FOR RDY MD	7 06499 J 06358
2006	GOTIT	MLNS	ADDR0061,RDYMSEG8	MOVE MOD ADDR	12 06506 D 06677 06545 1
2007		MLNS	INCODE,RDYMSEG12	MOVE CHANNEL NUMBER	12 06518 D 06408 06549 1
2008		B	TYP1		7 06530 J 01593
2009	RDYMSG	BCW	2TST MOD CH 2,C		13 06537
2010		ZA	2N14,X3	LOAD IX 3	11 06551 M 06910 00039
2011		B	06X3		7 06562 J 000H0

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UPDATE CHANNEL & MODULE ROUTINE

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PCLIN LABEL OPCOD OPERAND

CT ADDR INSTRUCTION

2012 N13XLT B MONTR

7 06569 J 02066

END TEST ROUTINE
OPCODE OPERAND

LABEL

PGLIN

2014
2015
2016
2017
2018
2019

*** END TEST ROUTINE

ENDTST

TYP1

DCN 2PASS2.G

BCE 2000.TAQ3.1

B 400

BRCH IF REPEATING

GO TO LOADER

7 06576 J 01593

4 06586

12 06588 B 02000 01003 1

7 06600 J 00400

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DA05

CT ADDR INSTRUCTION

PREPARE 1 INST LOOP & DATA FIELD

OPCOD OPERAND

PGLIN LABBU

2021 *** PREPARE ONE INSTRUCTION LOOP ***
2022 S TYP1
2023 DCW 3ONE INST. LOOP OPTION NOT AVAILABLE3
2024 DC 3,TRY ANOTHER OPTION2,6
2025 S PRGCTL
2026

7 06607 J 01593
35 06648
19 06667
7 06669 J 02238

PGLIN LABEL

OPCODE OPERAND

CT

ADDRS

INSTRUCTION

*** PROGRAM CONSTANTS ***

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
2028						
2029	ADDR00	DCW	2000000882.G	8	06676	
2030		DCW	2 2.G	1	06685	
2031	ADDR9	DCW	2000360882.G	8	06687	
2032		DCW	2 2.G	1	06696	
2033	ADDR2	DCW	2000080882.G	8	06698	
2034		DCW	2 2.G	1	06707	
2035	ADDR10	DCW	2000400882.G	8	06709	
2036		DCW	2 2.G	1	06718	
2037	ADDR43	DCW	2001800882.G	8	06720	
2038		DCW	2 2.G	1	06729	
2039	ADR200	DCW	2008000882.G	8	06731	
2040		DCW	2 2.G	1	06740	
2041	ADR249	DCW	2009960882.G	8	06742	
2042		DCW	2 2.G	1	06751	
2043	ADDR49	DCW	2001960882.G	8	06753	
2044		DCW	2 2.G	1	06762	
2045	ADR219	DCW	2008760882.G	8	06764	
2046		DCW	2 2.G	1	06773	
2047	ADR210	DCW	2008400882.G	8	06775	
2048		DCW	2 2.G	1	06784	
2049	ADR123	DCW	2005000882.G	8	06786	
2050		DCW	2 2.G	1	06795	
2051	VAR1AD	DCW	2000000882.G	8	06797	
2052	VARFLD	DCW	200000002.G	7	06806	
2053	RUTCNT	DCW	2 2	1	06814	
2054	BLANK	DCW	2 2.G	4	06818	
2055	TOTIME	DCW	2 2	4	06823	
2056	COUNT	DCW	2 2	2	06825	
2057	LOOPFI	DCW	20002	3	06828	
2058	TIMCNT	DCW	20000002	6	06834	
2059	CORR	DCW	2002	2	06836	
2060	WARNCT	DCW	20002	3	06839	
2061	LNGCNT	DCW	202	1	06840	
2062	CODEB3	DCW	23R12	3	06843	
2063		DCW	20X22	3	06846	

ADDRESSES

USED

IN

DA05C

PGLIN	LABEL	CONSTANTS OPCOD OPERAND	LT	ADDRS	INSTRUCTION
2064		DCW 2H332	3	06849	
2065		DCW 2'144	3	06852	
2066		DCW 22012	3	06855	
2067	LOOPX	DCW 2242	2	06857	
2068	CORRX	DCW 23162	3	06860	
2069	LOOPI	DCW 2682	2	06862	
2070	CORRI	DCW 23552	3	06865	
2071	LOOPO	DCW 2762	2	06867	
2072	CORRO	END			J
2072		2H2	1	06868	
2072		2H2	1	06869	
2072		2H2	1	06870	
2072		2H2	1	06871	
2072		2H2	1	06872	
2072		2H2	1	06873	
2072		2002092	3	06878	
2072		232	1	06879	
2072		272	1	06880	
2072		2002372	3	06885	
2072		222	1	06886	
2072		2013082	3	06891	
2072		2000002	3	06896	
2072		203152	4	06900	
2072		23002	3	06903	
2072		2572	2	06905	
2072		N14	3	06910	03670

END OF ASSEMBLY

1

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DA01, DA03
DA04, DA05

Page 269A

6.06.00 7631-1301 PACKAGE SUMMARY

The following few pages have been laid out so that information on them may be cut out and pasted onto IBM cards. In this way the CE may carry with him some of the important data required for the successful use of the programs in this package.

In concluding this package it is important to stress the fact that the programs are only as useful as the CE wants them to be. These programs and this package are a tool and a good knowledge of how to use this tool, and how it works will add to its usefulness. This knowledge is available in the write-ups and comments in the program listings, READ THEM CAREFULLY.

DA01, DA03
DA04, DA05

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NOTES

Cut along dotted lines and paste on IBM cards.

<p>DA01, DA03 DA04, DA05</p> <p><u>System and Channel Cards</u></p> <p>System Card No. 009 Channel 1 Card No. 010 Channel 2 Card No. 011 Channel 3 Card No. 012 Channel 4 Card No. 013</p> <p>Insure the proper data is punched in these cards.</p>	<p><u>Standard TADS 0-3</u></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Loc.</th> <th style="text-align: center; border-bottom: 1px solid black;">Not 1</th> <th style="text-align: center; border-bottom: 1px solid black;">1</th> </tr> <tr> <td>1000 TAD 0</td> <td>Allow Error Typeout</td> <td>Bypass Errors</td> </tr> <tr> <td>1001 TAD 1</td> <td>Do not Req Loop after Error</td> <td>Request Loop</td> </tr> <tr> <td>1002 TAD 2</td> <td>Not Used</td> <td></td> </tr> <tr> <td>1003 TAD 3</td> <td>Single Prog. Pass</td> <td>Repeat Prog.</td> </tr> </table> <p>* These TADs are set to 1 when the programs are loaded.</p> <p><u>Special TADS</u></p> <p>Memory locations 1004-1012 are set aside for special TADs and are set to 1 when the programs are loaded. Refer to individual write-ups for details.</p>	Loc.	Not 1	1	1000 TAD 0	Allow Error Typeout	Bypass Errors	1001 TAD 1	Do not Req Loop after Error	Request Loop	1002 TAD 2	Not Used		1003 TAD 3	Single Prog. Pass	Repeat Prog.
Loc.	Not 1	1														
1000 TAD 0	Allow Error Typeout	Bypass Errors														
1001 TAD 1	Do not Req Loop after Error	Request Loop														
1002 TAD 2	Not Used															
1003 TAD 3	Single Prog. Pass	Repeat Prog.														

<p>DA01, DA03 DA04, DA05</p> <p><u>Program Control Options</u></p> <p>These options are available through use of the console.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black;">Enter</th> <th style="text-align: center; border-bottom: 1px solid black;">To</th> <th style="text-align: center; border-bottom: 1px solid black;">Additional Data Entered</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">b</td> <td>Terminate Test</td> <td>None</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Reset All Standard TADS</td> <td>Four New TAD Settings 1 or 1</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Alter Memory</td> <td>Five Digit Memory Addr.</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Alter Routine Seq.</td> <td>Routine Numbers in Order Desired</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Loop a Routine</td> <td>Starting Address of Routine</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Loop an Inst.</td> <td>Inst. Code, Data for Desired Field</td> </tr> <tr> <td style="text-align: center;">6</td> <td>Restart at Desired Location</td> <td>Five Digit Mem Addr to Start at</td> </tr> <tr> <td style="text-align: center;">7</td> <td>Continue from Point of Interruption</td> <td>None</td> </tr> </tbody> </table> <p>* Read package write-up for details on control options.</p>	Enter	To	Additional Data Entered	b	Terminate Test	None	1	Reset All Standard TADS	Four New TAD Settings 1 or 1	2	Alter Memory	Five Digit Memory Addr.	3	Alter Routine Seq.	Routine Numbers in Order Desired	4	Loop a Routine	Starting Address of Routine	5	Loop an Inst.	Inst. Code, Data for Desired Field	6	Restart at Desired Location	Five Digit Mem Addr to Start at	7	Continue from Point of Interruption	None	<p>READ THE PROGRAM WRITE-UPS</p>
Enter	To	Additional Data Entered																										
b	Terminate Test	None																										
1	Reset All Standard TADS	Four New TAD Settings 1 or 1																										
2	Alter Memory	Five Digit Memory Addr.																										
3	Alter Routine Seq.	Routine Numbers in Order Desired																										
4	Loop a Routine	Starting Address of Routine																										
5	Loop an Inst.	Inst. Code, Data for Desired Field																										
6	Restart at Desired Location	Five Digit Mem Addr to Start at																										
7	Continue from Point of Interruption	None																										

<p>DA01, DA03 DA04, DA05</p> <p><u>Automatic Restart</u></p> <p>If the check control switch is set to reset and restart, the programs will automatically continue after a machine alarm condition.</p> <p><u>Manual Restart</u></p> <p>If the check control switch is not used, pressing Computer Reset and Start will get the program running after an alarm.</p>	<p><u>Loading Procedure</u></p> <p>Use Universal Loaders and procedure with all "DA" programs.</p> <p><u>Error Typeout Standard Format</u></p> <ol style="list-style-type: none"> 1. "Routine N00" Routine number in which error occurred. 2. "Error 00 0000 M% F0 0000 W 1248AB" <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="text-align: center; border-right: 1px solid black; width: 20%;">Error Flag</td> <td style="text-align: center; border-right: 1px solid black; width: 20%;">Starting Addr of Routine</td> <td style="text-align: center; border-right: 1px solid black; width: 20%;">Error No.</td> <td style="text-align: center; border-right: 1px solid black; width: 20%;">Failing Inst.</td> <td style="text-align: center; width: 20%;">Status Ind. is Found on</td> </tr> </table> <ol style="list-style-type: none"> 3. "Pertinent Data" Failing Addr, sample of data field, etc. 4. "Req Error Action" Given if TAD 1=1 CE now requests any one of the program control options. 	Error Flag	Starting Addr of Routine	Error No.	Failing Inst.	Status Ind. is Found on
Error Flag	Starting Addr of Routine	Error No.	Failing Inst.	Status Ind. is Found on		

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DA01, DA03
DA04, DA05

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DA01	CAUTION: This Prog. destroys customer data.	Special Requests				
Switch Settings Previous to Running Program 1. Write Format On (on every 1301 to be tested) 2. Write HAO On 3. All 1301 not to be tested set inop.		1. "Sel. Mode" Enter X 0000 Mode-Test Code _____ ↑ Start Test at this HAI Addr. _____				
		Mode-Test Codes				
		Test	Entire Mod.	One Cyl.	One Track	One Sur
Special TAD 0 (Location 1004) 1̄ Do not display failing addr. 1 Display failing addr. * Set to 1̄ when program is loaded.		Write HAI's and Verify Addr.	1	A	J	/
		Verify Addr	2	B	K	S
		Analyze Surface	3	C	L	T
		Write HAI's, Analyze Surface, Verify Addr.	4	D	M	U
		Analyze Surface and Verify Addr	5	E	N	V

<p><u>DA01</u></p> <p><u>Special Requests (continued)</u></p> <ol style="list-style-type: none"> 2. "Test Mod X CHX" Enter 1 if correct Enter 1̄ if incorrect 3. "Turn On CE-HAO" "Turn Off CE-HAO" Turn switch On or Off press start 4. "Trck Flgd OK" Select next desired program option (Only given if track is flagged) 	<p><u>Special Option Flag-A-Track</u></p> <p>The program will flag a track only at the CE's request.</p> <p>To Flag-A-Track</p> <p>Press Inquiry</p> <p>Enter 8 0000 1</p> <p>Press Release</p> <p>Flag-A-Track option code (HA1 of the track to be Flgd)</p> <p>Flagging is complete when "Trck Flgd OK" is typed. CE must now select next option desired.</p> <p>Flag Char to be used</p>
---	---

<p><u>DA03</u></p> <p><u>Switch Settings Previous to Running Program</u></p> <ol style="list-style-type: none"> 1. Write Format On (on all 1301 to be tested) 2. Write HAO On (on all 7631 to be tested) 3. All 1301 not being tested are set inop. 	<p><u>Special TAD 0 (Location 1004)</u></p> <p>1 Program is not run in manual mode</p> <p>1 Program is run in manual mode</p> <p>* TAD 0 set to 1 when program is loaded.</p>
<p><u>Files - Tapes Overlapped</u></p> <p>Run program in manual mode with tape drive "1" ready on all channels that don't have files.</p>	<p><u>Special Request (Manual Mode Only)</u></p> <p>"CYO Avail" Enter 1 if it is available Enter 1 if it is not available</p> <p>"CE-HAO ON"</p> <p>"Addr Read, 0000000, CE-HAO OFF"</p> <p>Turn switch on or off</p> <p>Press start to continue</p>
	<p><u>Standard Options</u></p> <p>All standard options are available in this program.</p>

DA01, DA03
DA04, DA05

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DA03

Reliability Run

Load program

Alter normal TAD 0 (Loc 1000) to 1 -
Bypass timeouts

Alter normal TAD 3 (Loc 1003) to 1 -
Repeat test

Summary of errors will be given after
each pass of the program.

Terminate test by altering normal TAD 3
(Loc 1003) to 1

Alter Routine Sequence

The sequence in which the test
routines run may be altered by
selecting program control option
Code 3.

Read package write-up for details.

DA04

Switch Settings Previous
to Running Program

1. 1301 Mod 0 ready on each
channel being tested (Wrt
Fmt On)
2. HAO and CE-HAO On (on
every 7631 being tested)
3. 1301 Mod 1-9 set inop
on all channels being tested
4. Check Control Switch set to
reset and restart (1410)

Special Requests

1. "HAO, Wrt Fmt On, Sel Mode"
Enter 1 to run manual mode
Enter 1 to run automatic mode
2. "Comp Reset, Chk 7631"
Press Computer Reset Check
condition of 7631, press start if 7631
is OK.
3. "ACC to Cyl 000"
"ACC to Cyl 110"
"ACC to Cyl 194" } Manual Mode Only
Manually position access to cylinder
specified, press start.

DA04

Special Requests (continued)

4. "ACC to Cyl 253"
Insure access is positioned
at cylinder 253, press start.
5. "# of Spare Heads"
Enter number of heads avail-
able for alter. tracks
6. "CE-HAO Off"
Turn off CE-HAO switch,
press start
7. "CYO"
Enter 1 if it is
Enter 1 if it is not

8. "MOD 3"
Enter 1 if 7631 is a model 3
Enter 1 if 7631 is not
9. "HAO and Wrt Fmt Sws Off" (Manual
Mode only)
Turn switches off, press start
10. "Write Inhibit and HAO Sws On"
(Manual Mode Only)
Turn switches on, press start
11. "Wrt Inhibit Off, HAO and CE-HAO On"
Turn switches off and on, press start.
12. "Pass, SWS OFF"
Test is complete, reset all switches,
press start.

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DA01, DA03
DA04, DA05

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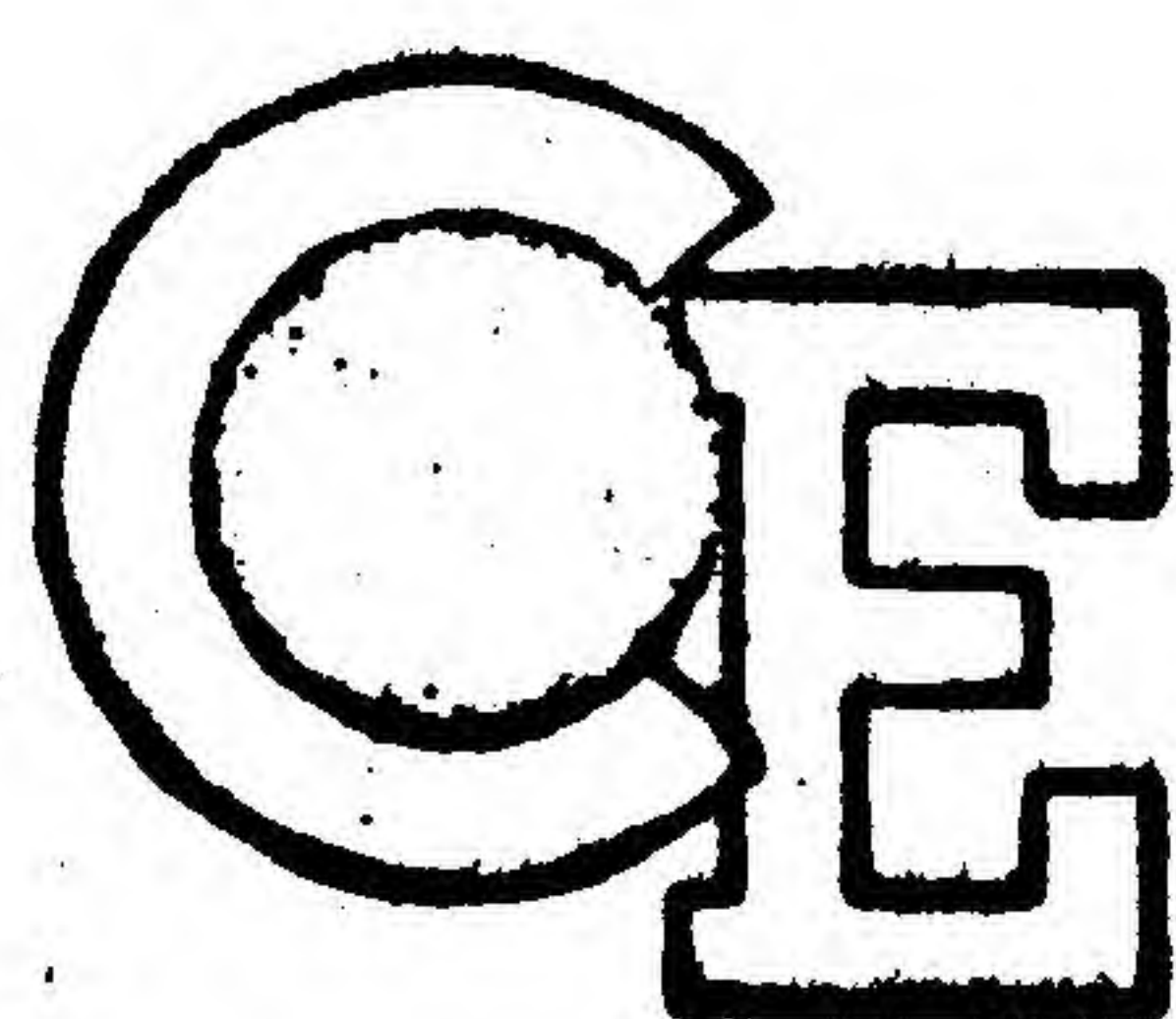
Cut along lines and paste on IBM cards.

<p><u>DA05</u></p> <p><u>Switch Settings Previous to Running Program</u></p> <ol style="list-style-type: none"> 1. Write HAO On (on all 1301 being used) 2. Write Inhibit On (Only if in manual mode) 3. All 1301 not being tested are set inop. 	<p><u>Special Requests</u> (Made in Manual Mode only)</p> <ol style="list-style-type: none"> 1. "CE-HAO On" Turn on switch, press start 2. "Addr Read, 0000000, CE-HAO Off" Turn off switch, press start
<p><u>Special TAD 0 (Location 1004)</u></p> <p>1 Do not display failing Addr Do not take additional 20 min warm up</p> <p>1 Display failing Addr, take) Manual additional 20 min warm up) Mode</p>	<p><u>Standard Options</u></p> <p>Two standard options are not available in this program.</p> <p>Alter routine sequence Code 3 One instruction loop Code 5</p>

300



001



IBM POUGHKEEPSIE

April 15, 1964

Diagnostic Engineering Publications

1410/7010

Subject: Diagnostic Program SF01B - Shared File Program

Sequence Number 555
Replaces SF01A

- I** This Update corrects: The errors which prevented this program from being placed on the edited TC50 Tape
- II** System & Channel Control Cards numbered 001-005

Enclosures: 024 Pages

Card Deck for CARD ONLY SYSTEMS (as punched by UP51)

8 Cards - Card Loader and Core Clear

35 Cards No. 001-035 Data Cards

1 Card Execute Card

Distribution: 1410

7010

Other 1410/7010 Installations with 1301 - 7631 shared with another system

003

4/15/64
SF01
Page 001

APR 15 1964

SF01B

1410 Share File Program

April 15, 1964

**This Program has been altered with this Up Date.
This Program uses System & Channel Control Cards.
Read the Write Up Carefully.**

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SHARE FILE PROGRAM**6.06.00.0 TEST DESCRIPTION**

The purpose of this test is to check those circuits associated with "Shared System Operation" that are not checked by other 7631 Disk/Drum programs. This test attempts no data transfers and uses only "Seek" and release orders along with the I/O no-op. For purposes of clarification, the term "System A," will be used to denote that computer which has control of the 7631, and "System B" to denote that computer which will attempt to gain control. In conjunction with an equivalent program in the other computer of this "Shared System," the test will be run in two parts.

1. As "System A"
2. As "System B"

While running as "System A," this program will retain control of the 7631 by performing "seeks." While running as "System B," this program will attempt to gain control of the 7631 by using "release;" this attempt should be unsuccessful.

When "System B" has completed its test it will halt (1000 passes). At this point "System A" is stopped, releasing the 7631. "System B" may be started now as "System A"; it will test and reset the attention caused by first "System A" and then begin the seek routine.

Note: The 1410 must always be started as System "A" first and the Sharing System as "B."

00.1 EQUIPMENT

- A. 1411 with 10K memory
- B. Card Reader or Tapes
- C. 1301 (addressed as Mod 0)
- D. 7631 Model III

6.06.00.0 TEST DESCRIPTION (continued)**00.2 CARD DECK**

- A. 1 Execute card, Core clear.
- B. 34 Data cards
- C. 1 Execute card, branch to start of program.

00.3 EC LEVEL OF MACHINE**6.06.01.0 LOADING PROCEDURES****01.1 FROM CARDS (Load Program L1A preceding Card Deck)****A. 7010/1410 without Load Button**

- 1. Display Memory Location 00000
- 2. Alter to

^V_V
RL%1100011\$.^V
^V
X ☐

} Enter according to channel
location of the card reader.

- 3. Set to Run, Computer Reset and Start.

B. 7010 with Load Button

- 1. Computer Reset
- 2. Depress Load Button

01.2 FROM TAPE (80 Character Master or Memory Dump Tape)**A. 7010/1410 without Load Button**

- 1. Display Memory Location 00000
- 2. Alter to

^V_V
RL%B000011\$.^V
^V
X ☐

} Enter according to channel
location of the tape drive.

- 3. Set to Run, press Computer Reset.

B. 7010 with Load Button

- 1. Computer Reset
- 2. Depress Load Button

6.06.02.0 OPERATING PROCEDURES

After loading an equivalent program into both computers of the "Shared System," both systems will halt.

The program in that computer which will be "System A" should be started first (1410 must be started first), using the "seek" routine. The program in that computer which will be "System B" should be started second, using the "release" routine.

After "System B" has tested the availability of the 7631, the program will halt. "System A" should now be stopped, releasing the 7631. The computer that was "System B" is now started and run as "System A" and "System A" is run as "System B."

02.1 1410 AS "SYSTEM A" AT START OF THE TEST

- A. Load program in the 1410 and load the "Sharing System."
- B. When the 1410 stops (location 02119) and the "Sharing System" stops, press Computer Reset and Start on the 1410. The 1410 will take control of 7631 with "seek" ops.
- C. After the "Sharing System" has completed its test as "System B," the 1410 (System A) is stopped by pressing Inquiry Request and Release. The 1410 will stop at location 02428.
- D. The "Sharing System" is now started as "System A." After the Sharing System has been started, the 1410 is started as "System B"; this is done by pressing Start.
- E. When the 1410 stops (location 02183), the test is complete and the Sharing System may be stopped.
- F. The procedure may be repeated as often as is necessary by pressing Start; the 1410 will now be System "A" (step B). Continue from step C.

6.06.03.0 OPERATING HINTS, COMMENTS

- A. Insure that the channel cards, cards numbered 3, 4, 5 and 6, are correctly punched. (Refer to Introductory Material.) These cards will reflect the location of the 1301 module 0 attached to model III 7631.
- B. Scoping loops may be entered, after an error has occurred, by entering a 1 on the typewriter. A scoping loop may be terminated by pressing Inquiry Request and Release.
- C. There are no TAD's (1000-1003) or Special TAD's used in this program; error messages will be given and error halts will be executed.

6.06.04.0 PROGRAM STOPS AND RESTARTS

The following is a list in sequential order of the stops which can occur in this program. An "N" on the far left side indicates a normal halt.

	<u>Memory Location</u>	<u>Purpose</u>
N	2119	Program stops after initializing; the decision is now made whether the 1410 will be "System A or B." To start as "System A" press Computer Reset and Start. To start as "System B" press Start.
N	2183	If the 1410 is "System B" this halt occurs when the "release routine" is complete. By pressing Start the 1410 starts running as "System A."
N	2428	This stop occurs when the 1410 is "System A" and the Inquiry Request and Release have been pushed to terminate the "System A" test. Press Start and the 1410 becomes "System B."
	2610	<u>Error halt</u> occurs when "System B" receives no attention from the "System A" seeks, and the loop option was not taken. Press Start and the 1410 will be started as "System A."
	2629	<u>Error halt</u> occurs when "System A" does not get interrupted from the seek completes. By pressing Start the "System A" routine is restarted.
	2660	<u>Error halt</u> occurs when the 7631 is not initially available to "System A." By pressing Start the "System A" routine is restarted.
	2744	<u>Error halt</u> occurs when "System A" releases the 7631 and "System B" fails to gain control. By pressing Start "System B" will again try to get control of the 7631.

7631 TIMEOUTSA Normal Timeouts

1. "SF01B" Title

B Error Timeouts

1. "ER1, Enter 1 to Loop"

This timeout occurs when the 7631 does not lock out "System B" while system A has control. If a loop is desired, enter 1 on the typewriter; if not, enter a blank.

2. "ER2, Enter 1 to Loop"

This timeout occurs when "System B" has received no attention from the 7631 due to the seeks given by "System A." If a loop is desired enter a 1, if not, enter a blank.

3. "ER3, Enter 1 to Loop"

This timeout occurs when "System B" tries to get control of the 7631 after "System A" has issued a release to it. The error indicates that "System B" could not get control of the 7631. If a loop is desired enter a 1, if not, enter a blank.

02000

Print
Title

Initialize
Program

Halt

(Press Computer Reset & Start if this CPU A)

A

(Press Start if this
CPU B)

Release
Op

Busy
?

No

Yes

Add 1 to
Pass Count

Type out
Initial Error
Message

No
10 Passes
?

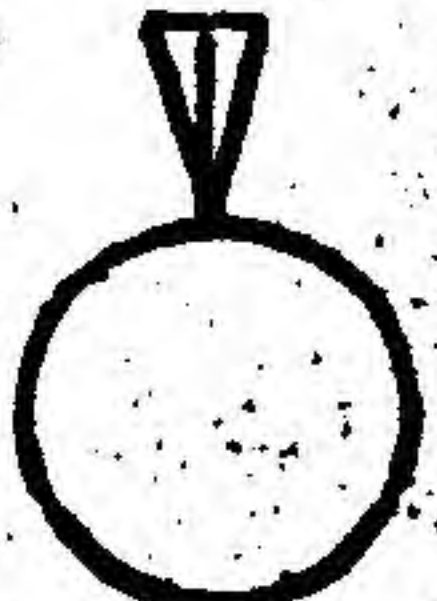
No

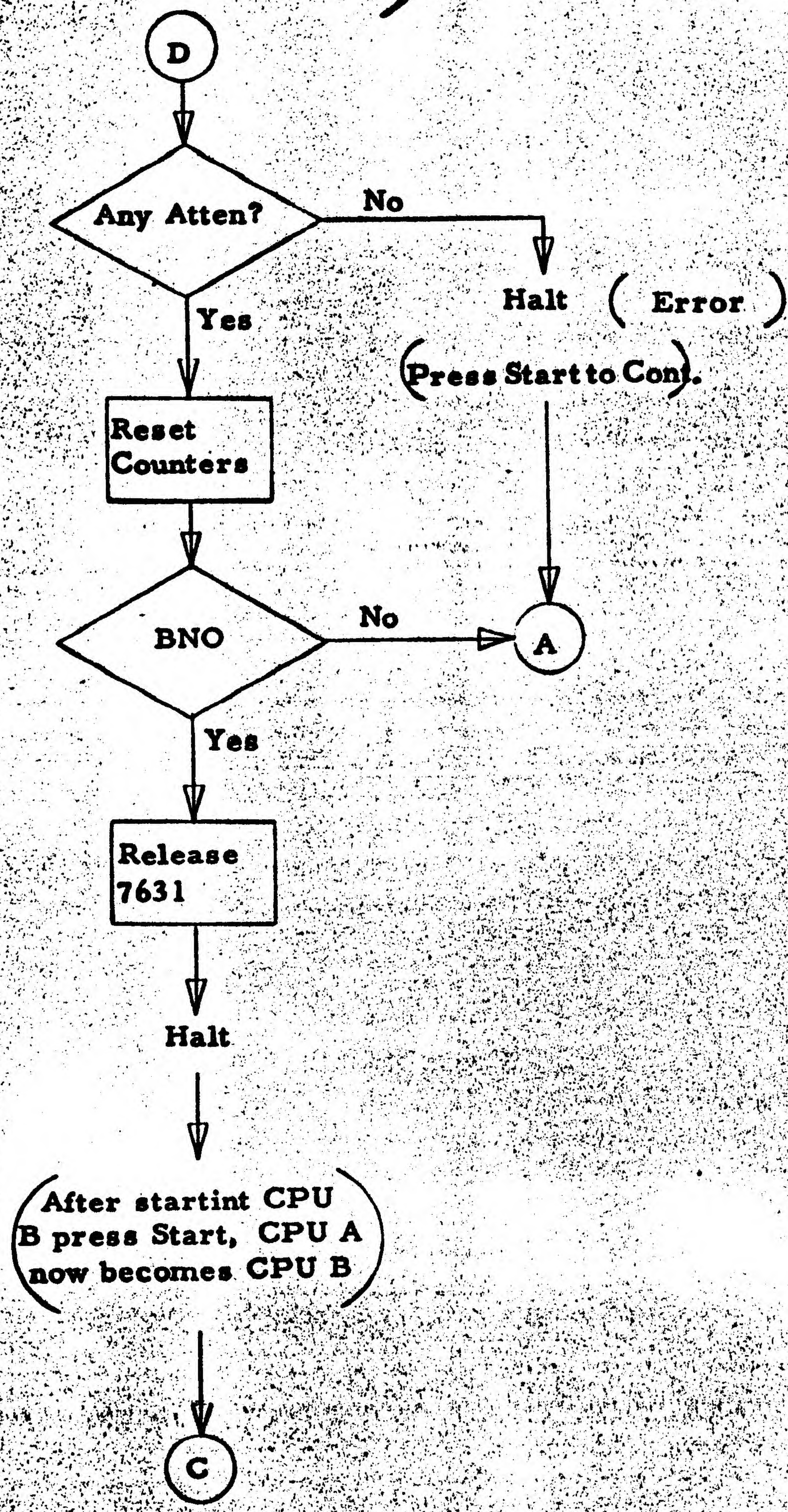
Loop
on Error

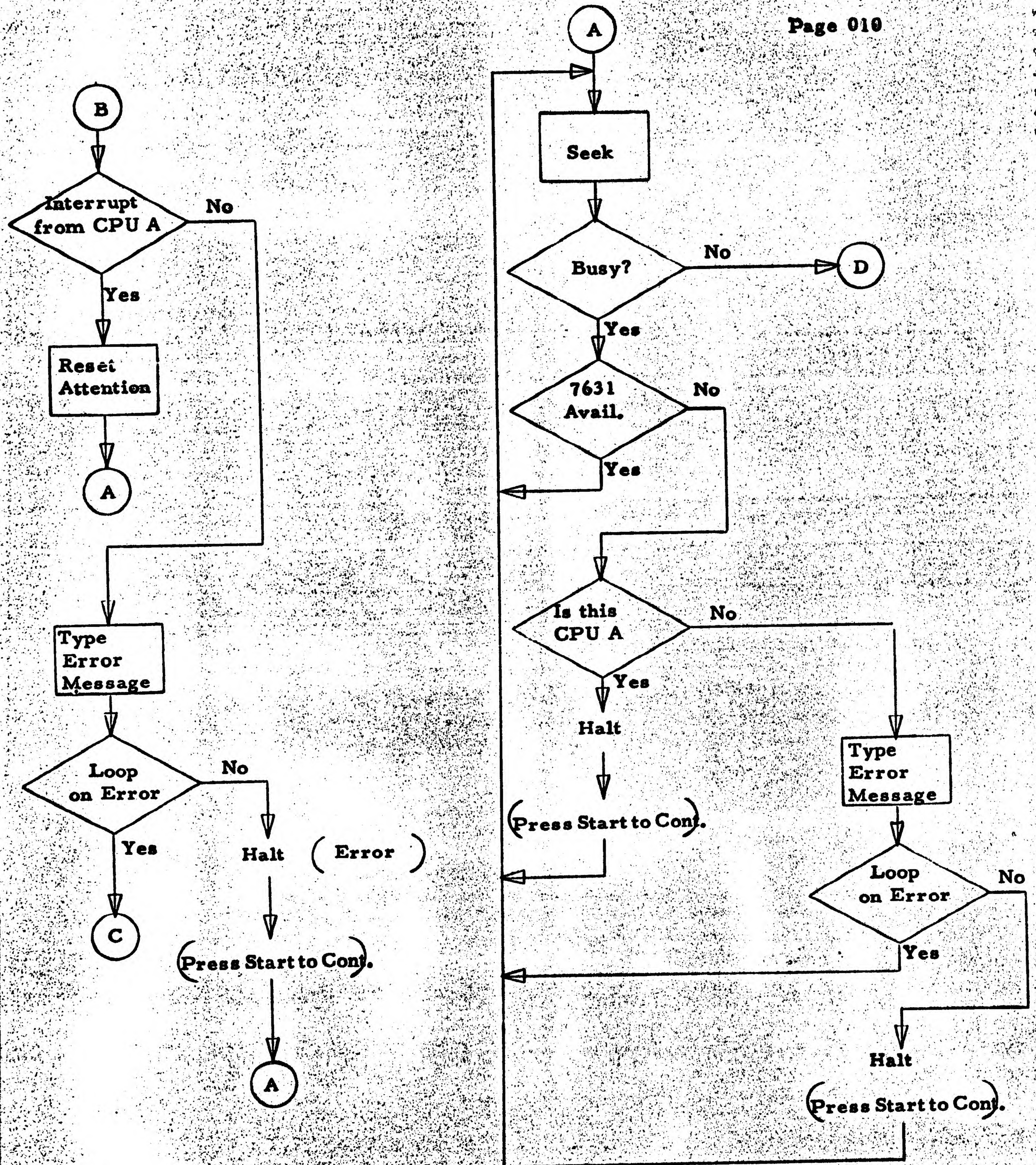
Yes

Halt (End Test 1)

(After stopping CPU
A press Start, CPU
B now becomes CPU
A)







SUMMARY

This program runs on the 1410 while a similar program runs on the system that is sharing the 7631. If the 1410 has control of the 7631, the sharing system should be locked out and it tests this to insure that it is. When the sharing system has control of the 7631, the 1410 is locked out and the program verifies this.

In order to synchronize the program in the 1410 with the program in the sharing system, program stops and manual intervention are used. According to which system is started first determines who has control of the 7631 and who is locked out. The system in control is considered "System A," the locked out system is "System B." The 1410 must always be started first as System "A."

1410 As System A, then B

1. Load program in 1410, load the sharing system's program.
2. When program stops (in both systems), press Computer Reset and Start. Then start the sharing system.
3. When sharing system stops again, stop the 1410 by pressing Inquiry Request and Release.
4. Start the sharing system, then start the 1410 by pressing Start.
5. The 1410 will STOP; the test is now complete.

014

015

APR 15 1964

SF01 MULT SYSTEM SHARED FILE TEST

SF01 INSTRUCTION

CT ADDR

OPCOD OPERAND

LABEL

PGLIN

1002	ORG	1242			01242
1003	DCW	2102		2	01243
1004	DCW	22555+32		6	01249
1005	ORG	1250			01250
1006	DCW	2SF0182,G		5	01250

LOCATE CHANNEL CARDS

1007					
1008					
1009					
1010	ORG	1289			01289
1011	DC	2		37	01325
1012	ORG	1346			01346
1013	DC	2		37	01382
1014	ORG	1403			01403
1015	DC	2		37	01439
1016	ORG	1460			01460
1017	DC	2		37	01496

CHANNEL ONE CRD

CHANNEL TWO CRD

CHANNEL THREE CRD

CHANNEL FOUR CRD

016

SF01

INITIALIZE SF01

CT ADDR INSTRUCTION

PGLIN	LABEL	OPCODE	OPERAND	PRINT TITLE	CT	ADDR	INSTRUCTION
1019		ORG	2000			02000	
1020		HCP	TITLE		10	02000	M XTO 01250 M
1021		BAL	*61		7	02010	R 02017 M
1022		S	FIRST	RESET	6	02017	S 02763
1023		CW	SKSW61,AVAIL61	SWITCHES	11	02023	M 02409 02316
1024		CW	RELSW61		6	02034	M 02886
1025		BCE	START,1308,F	BRCH IF FILE ON CH 1	12	02040	B 02088 01308 F
1026		BCE	INIT2,1365,F	BRCH IF FILE ON CH 2	12	02052	B 02937 01365 F
1027		BCE	INIT3,1422,F	BRCH IF FILE ON CH 3	12	02064	B 02956 01422 F
1028		BCE	INIT4,1479,F	BRCH IF FILE ON CH 4	12	02076	B 02975 01479 F
1029	START	MRCWG	RESET,1	MOVE RESET TO LOC 1	12	02088	D 02744 00001 L
1030		MRCWG	INTER,101	MOVE INTERRUPT ROUT	12	02100	D 02765 00101 L
1031		SW	FILE62		6	02112	, 03286
1032		M			1	02118	.

I410/7010 AS SYSTEM 2

OPCODE OPERAND

PGLIN LABEL

00370 CPU8 MU XF9,FILECP,R RELEASE
 03800 A BAL *C1
 S 00390 B BC81 *C8 BRCH BUSY
 00400 B ERROR1 BRCH ON ERROR
 00410 A 212,COUNT3 ADD 1 TO PASS COUNT
 S 420 BZ *C8 BRCH IF 1000 PASSES
 00430 B CPU8
 00440 BEPA *C1 ENTER ALERT MODE
 00450 M HACT END TST1
 00460 A 212,COUNT DELAY FOR INTERRUPT
 00470 BZ ERROR2
 00480 B DELAY

SF01 PAGE 20

CT ADDR INSTRUCTION

10 02119 M XF9 038H4 R
 7 02129 R 02136 M
 7 02136 R 02150 2
 7 02143 J 02428
 11 02150 A 03303 03196
 7 02161 J 02175 V
 7 02168 J 02119
 7 02175 Y 02182 E
 1 02182 -
 11 02183 A 03303 03183
 7 02194 J 02513 V
 7 02201 J 02183

017

PGLIN	LABEL	ERROR ROUTINES	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
00760	ERROR1	BNQ	EXIT1		7	02428	J 02500 Q
00770		BCE	CPUB,199,1		12	02435	B 02119 00199 L
00780		WCP	MSG1		10	02447	M XTO 03209 M
00810		BAI	001		7	02457	R 02464 M
00820		RCP	199		10	02464	M XTO 00199 R
00830		BEX1	16,M		7	02474	R 02464 M
00840		BAI	001		7	02481	R 02488 M
00850		BCE	CPUB,199,1		12	02488	B 02119 00199 L
00860	EXIT1	S	199		6	02500	S 00199
00870		B	STOPI		7	02506	J 02182
00880	ERROR2	BXPA	001		7	02513	Y 02520 X
00890		S	COUNT		6	02520	S 03183
00900		BNQ	EXIT2		7	02526	J 02598 Q
00910		BCE	CPUB,199,1		12	02533	B 02119 00199 L
00920		WCP	MSG2		10	02545	M XTO 03229 M
00930		BAI	001		7	02555	R 02562 M
00940		RCP	199		10	02562	M XTO 00199 R
00970		BEX1	16,M		7	02572	R 02562 M
00980		BAI	001		7	02579	R 02586 M
00990		BCE	CPUB,199,1		12	02586	B 02119 00199 L
01000	EXIT2	S	199		6	02598	S 00199
01010		H	CPUA		6	02604	- 02208
01020	ERROR3	S	COUNT2		6	02610	S 03193
01030		BXPA	001		7	02616	Y 02623 X
01040		H	CPUA		6	02623	- 02208
01050	TOLONG	CW	AVAIL01		6	02629	0 02316
01060	ERROR4	BCE	STOP3,FIRST,1		12	02635	B 02654 02763 L
01070		B	007		7	02647	J 02660
01080	STOP3	H	CPUA		6	02654	- 02208
01090		BNQ	EXIT3		7	02660	J 02732 Q
01100		BCE	CPUA,199,1		12	02667	B 02208 00199 L
01110		WCP	MSG3		10	02679	M XTO 03250 M
01140		BAI	001		7	02689	R 02696 M
01150		RCP	199		10	02696	M XTO 00199 R
01160		BEX1	16,M		7	02706	R 02696 M
01170		BAI	001		7	02713	R 02720 M

PGLIN	LABEL	ERROR ROUTINES	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
01180		BCE	CPUA,199,1	BRCH TO LOOP	12	02720	B 02208 00199 1
01190	EXIT3	S	199	RESET LOOP SWITCH	6	02732	S 00199
01200		H	CPUA		6	02738	. 02208
01210	RESET	A	012, FIRST	SET CPUA INDICATOR	11	02744	A 03303 02763
01220		B	CPUA		7	02755	J 02208
01230		H			1	02762	.
01240	FIRST	DCW	3 2		1	02763	
01250		DCW	6 2		1	02764	

PCLIN	LABEL	RESTART AND INT OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
01260		JOB	SFOIA RESTART AND INTERRUPT ROUTINES			
12601	INTER	BAL	*81	7	02765	R 02772 M
1270		S	COUNT	6	02772	S 03183
3 01280		S	COUNT2	6	02778	S 03193
01290		S	COUNT3	6	02784	S 03196
01300		S	COUNT4	6	02790	S 03207
01310		S	199	6	02796	S 00199
01320		BXPA	*81	7	02802	Y 02809 X
01330		BCE	SKTST.FIRST,1	12	02809	B 02830 02763 1
01340		B	LOCK	7	02821	J 02868
01360		H		1	02828	.
01370		BCW	8M2	1	02829	.
01380		MU	XFO,FILE,Q	10	02830	M 2FO 03284 Q
13801		BCBL	--16	7	02840	R 02830 2
5 01390		BAL	*81	7	02847	R 02854 M
13901		BNQ	REL31	7	02854	J 02367 Q
5 01410		B	CPUA	7	02861	J 02208
01420		MU	XFO,FILE,Q	10	02868	M 2FO 03284 Q
01430		BAL	*81	7	02878	R 02885 M
01440		NOPM		1	02885	N
01450		B	ENDTST	7	02886	J 02906
01460		SW	SKSW61	6	02893	. 02409
01470		B	CPUA	7	02899	J 02208
01480		WCP	MSG4	10	02906	M 2FO 03270 M
01490		BCBL	--16	7	02916	R 02906 2
01500		BAL	*81	7	02923	R 02930 M
01530		H	*00	6	02930	. 00400
01540		H		1	02936	.

RESET COUNTER

EXIT ALERT MODE

BRANCH IF IN SK TEST

NO-OP TO RESET SEEK

BRCH BUSY

BRCH ON INQ

NO-OP TO RESET SEEK

GO TO END TEST

TURN ON SEEK SWITCH

TYPE PUT END MESSG

CALL IN NEXT TEST

CHANNEL INITIALIZE AND PROGRAM CONSTANTS

SF01

CT ADDR INSTRUCTION

PGLIN LABEL

OPCOD OPERAND

CT ADDR INSTRUCTION

01560	INIT2	MLCA	CH2,CHCODE	MOVE CH 2 CODES	12	02937	D 03298 03296 T
01570		B	INITS		7	02949	J 02987
01580	INIT3	MLCA	CH3,CHCODE	MOVE CH 3 CODES	12	02956	D 03300 03296 T
01590		B	INITS		7	02968	J 02987
01600	INIT4	MLCA	CH4,CHCODE	MOVE CH 4 CODES	12	02975	D 03302 03296 T
01610	INIT5	MLCS	CHCODE-1,CPU8E1	INITIALIZE PROG	12	02987	D 03295 02120 3
01620		MLCS	CHCODE-1,SEEK21		12	02999	D 03295 02253 3
01630		MLCS	CHCODE-1,REL31E1		12	03011	D 03295 02368 3
01640		MLCS	CHCODE-1,SKTST21		12	03023	D 03295 02831 3
01650		MLCS	CHCODE-1,LOCK21		12	03035	D 03295 02869 3
01660		MLCS	CHCODE,A		12	03047	D 03296 02129 3
01670		MLCS	CHCODE,B		12	03059	D 03296 02136 3
01680		MLCS	CHCODE,C		12	03071	D 03296 02276 3
01690		MLCS	CHCODE,D		12	03083	D 03296 02262 3
01700		MLCS	CHCODE,E		12	03095	D 03296 02377 3
01710		MLCS	CHCODE,F		12	03107	D 03296 02384 3
01720		MLCS	CHCODE,G		12	03119	D 03296 02847 3
01721		MLCS	CHCODE,G-7		12	03131	D 03296 02840 3
01730		MLCS	CHCODE,H		12	03143	D 03296 02878 3
017301		MLCS	CHCODE,INTER		12	03155	D 03296 02765 3
01740		B	START		7	03167	J 02088
01750	COUNT	DCW	2000000000000		10	03183	
01760	COUNT2	DCW	2000000000000		10	03193	
01770	COUNT3	DCW	2		3	03196	
01780	COUNT4	DCW	2000000000000,G		11	03207	
01800	MSG1	DC	2ER1,ENTER 1 TO LOOP2,G		19	03209	
01840	MSG2	DC	2ER 2,ENTER 1 TO LOOP2,G		20	03229	
01830	MSG3	DC	2ER3,ENTER 1 TO LOOP2,G		19	03250	
01820	MSG4	DC	2TEST COMPLETE2,G		13	03270	
01790	FILE	DCW	20000000882,G		6	03284	
01800		DC	2		1	03293	
01810		DCW	2		1	03294	
01820	CHCODE	DCW	2		2	03296	
01830	CH2	DCW	2222		2	03298	
01840	CH3	DCW	2'32		2	03300	
01850	CH4	DCW	2'12		2	03302	

SF01 INSTRUCTION

CHANNEL INITIALIZE AND PROGRAM CONSTANTS

PGLIN	LABEL	OPCODE	OPERAND	CT	ADDRS	J02000
01860		END	2000	1	03303	
01860			212	4	03307	
01860			203602			

END OF ASSEMBLY

